Appendixes H, I, J, K, and L

Environmental Impact Statement for Proposed Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Prepared for

National Aeronautics and Space Administration

July 2013

This page intentionally left blank.

Contents

This page intentionally left blank.

APPENDIX H

Supplemental Air Quality and Greenhouse Gas Information and Technical Approach

This page intentionally left blank.

APPENDIX H

Supplemental Air Quality and Greenhouse Gas Information and Technical Approach

PREPARED FOR: NASA

PREPARED BY: CH2M HILL

DATE: June 2013

This technical memorandum provides a detailed technical approach for the analysis conducted in the *Environmental Impact Statement for Proposed Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory (SSFL)*, including supplemental information and a description of the analytical methodologies and assumptions used for this study. The supplemental information and specific methodologies discussed are as follows:

- Regional Setting
- Demolition and Excavation
- Operation of Remedial Technologies

As discussed in Section 3.5 of the Environmental Impact Statement (EIS), the air pollutants of concern for this project are criteria pollutants for which ambient air quality standards exist and greenhouse gases (GHGs). Areas are assigned an attainment status based on their ability to meet these ambient air quality standards. The ambient air quality standards relevant to this project are included in Table H-1; Table H-2 provides a summary of the attainment status for the counties potentially affected by the Proposed Action. Section 4.7 of the EIS provides the results of this study, including the expected impacts to air quality and climate change. Appendix I includes a description of the technical approach used to perform the General Conformity analysis, conducted in support of the Section 4.7 results.

TABLE H-1
Ambient Air Quality Standards
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Pollutant	Averaging Time	NAAQS [a]	
		Primary	Secondary
Ozone	8 hours 1 hour	0.075 ppm —	0.075 ppm —
PM_{10}	Annual arithmetic mean 24 hours	— 150 µg/m³	— 150 µg/m³
$PM_{2.5}$	Annual arithmetic mean 24 hours	15 µg/m³ 35 µg/m³	15 µg/m³ 35 µg/m³
CO	8 hours 1 hour	9 ppm 35 ppm	— —
NO_2	Annual arithmetic mean 1 hour	0.053 ppm 0.100 ppm	0.053 ppm —
SO_2	24 hours 3 hours 1 hour	— — 0.075 ppm [b]	— 0.5 ppm —
Lead	Calendar quarter Rolling 3--month average 30--day average	1.5 µg/m³ 0.15 µg/m³ —	1.5 µg/m³ — —

Notes:
CO = carbon monoxide
µg/m³ = micrograms per cubic meter
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
ppm = parts per million
SO_2 = sulfur dioxide

[a] National standards other than ozone, particulate matter, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, is equal to or less than the standard.
[b] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 parts per billion.

Source: ARB (2010); accessed at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

TABLE H-2
Federal Attainment Status
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

County	California Air Basin or State	Attainment Status by Pollutant						
		Ozone [a]	**PM_{10}**	**$PM_{2.5}$**	**CO**	**NO_2**	**SO_2**	**Lead** [a]
Ventura	SCCAB	Serious Nonattainment [b]	Attainment	Attainment	Attainment	Attainment	Attainment	Attainment
Los Angeles	SCAB	Extreme Nonattainment [c]	Serious Nonattainment [c]	Nonattainment [c]	Serious Maintenance [c]	Attainment	Attainment [c]	Nonattainment [c]
San Bernardino	SCAB	Extreme Nonattainment [d]	Serious Nonattainment [d]	Nonattainment [d]	Serious Maintenance [d]	Attainment	Attainment	Attainment
	MDAB	Moderate Nonattainment [d]	Moderate Nonattainment [d]	Attainment [d]	Attainment [d]	Attainment	Attainment	Attainment
Kern	SJVAB	Extreme Nonattainment [e]	Serious Nonattainment	Nonattainment [f]	Attainment [g]	Attainment	Attainment	Attainment
Kings	SJVAB	Extreme Nonattainment [e]	Maintenance	Nonattainment	Attainment	Attainment	Attainment	Attainment
Inyo	GBVAB	Attainment for all pollutants [h]						
Nye	Nevada	Attainment for all pollutants						
Clark	Nevada	Former Subpart 1 [i]	Serious Nonattainment	Attainment	Serious Maintenance	Attainment	Attainment	Attainment
Lincoln	Nevada	Attainment for all pollutants						
White Pine	Nevada	Attainment	Attainment	Attainment	Attainment	Attainment	Maintenance	Attainment

TABLE H-2
Federal Attainment Status
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

County	California Air Basin or State	Attainment Status by Pollutant						
		Ozone [a]	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	Lead [a]
Elko	Nevada	Attainment for all pollutants						
Tooele	Utah	Attainment	Attainment	Attainment [j]	Attainment	Attainment	Nonattainment [k]	Attainment

Notes:
GBVAB = Great Basin Valley Air Basin
MDAB = Mojave Desert Air Basin
SJVAB = San Joaquin Valley Air Basin
SCCAB = South Central Coast Air Basin
SCAB = South Coast Air Basin
Serious Nonattainment for ozone = area has a design value of 0.107 up to but not including 0.120 parts per million (ppm)
Extreme Nonattainment for ozone = area has a design value of 0.187 ppm and above
Serious Maintenance for CO = area has a design value of 16.5 ppm and above
Serious Nonattainment for PM_{10} = area that cannot practicably attain the standard by the deadline of section 188(b)(1) of the Clean Air Act (CAA)

[a] Considers the 2008 standard for lead and the 8-hour standard for ozone. Because these counties are nonattainment areas, the 1-hour ozone standard no longer applies per the anti-backsliding provisions of 40 Code of Federal Regulations (CFR) 51.905(a)(3) and (4). The anti-backsliding provisions apply to areas that are designated attainment for the 8-hour ozone standard and were, at the time of the 8-hour designations, either attainment areas with maintenance plans for the 1-hour standard or nonattainment for the 1-hour standard. Specifically, the anti-backsliding provisions require these areas to submit a maintenance plan under section 110(a)(1) of the CAA.
[b] Ventura County has partial serious nonattainment for ozone. The portion of the project occurring within Ventura County will occur in the nonattainment portion.
[c] The portion of Los Angeles County located within the SCAB has extreme nonattainment for ozone, serious nonattainment for PM_{10}, nonattainment for $PM_{2.5}$, serious maintenance for CO, and nonattainment for lead. The portion of the project occurring within Los Angeles County will occur in the SCAB and, therefore, in the nonattainment or maintenance areas for these pollutants.
[d] The portion of San Bernardino County located in the SCAB has extreme nonattainment for ozone, serious nonattainment for PM_{10}, nonattainment for $PM_{2.5}$, and serious maintenance for CO whereas the portion located in the MDAB has moderate nonattainment for ozone and PM_{10} and attainment for $PM_{2.5}$ and CO. The project will occur in both of these portions of San Bernardino County.
[e] Kern and Kings counties each have partial extreme nonattainment for ozone. The portion of the project occurring within Kern and Kings counties will occur in the nonattainment portions.
[f] Kern County has partial nonattainment for $PM_{2.5}$. The portion of the project occurring within Kern County will occur in the nonattainment portion.
[g] The metropolitan area of Bakersfield, located within Kern County, has partial maintenance for CO. The portion of the project occurring within Kern County will not occur within this metropolitan area and is, therefore, in attainment.
[h] Inyo County has PM_{10} nonattainment and maintenance for two specific areas: Owens Valley and Coso Junction, respectively. The portion of the project occurring within Inyo County would occur at least 100 miles from these areas. All portions of Inyo County have attainment for all other pollutants.
[i] Clark County has partial Former Subpart 1 status for ozone, serious nonattainment for PM_{10}, and serious maintenance for CO. The portion of the project occurring within Clark County would occur in the nonattainment and maintenance portions for these pollutants.
[j] Tooele County has partial nonattainment for $PM_{2.5}$. The portion of the project occurring within Tooele County would not occur in this nonattainment portion.
[k] Tooele County has partial nonattainment for SO_2. Based on the available data, the portion of the project occurring within Tooele County may or may not occur in the nonattainment portion. As a conservative approach, it was assumed that the project would occur in the nonattainment portion.

Source: EPA (2012)

Regional Setting

As noted in Section 3.5, the most recent published emission inventory data for the region of influence (ROI), which includes Ventura, Los Angeles, and Kern counties, are provided in Tables H-3 through H-5.

TABLE H-3
Estimated Annual Average Emissions for Ventura County (tons per day)
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Source Category	TOG	VOC	CO	NOx	SOx	PM	PM_{10}	$PM_{2.5}$
Stationary Sources								
Fuel Combustion	4.9	0.7	7.7	4.4	0.2	0.6	0.6	0.6
Waste Disposal	20.5	0.2	0.5	0.1	0.1	0.0	0.0	0.0
Cleaning and Surface Coatings	7.6	5.4	-	-	-	0.1	0.1	0.0
Petroleum Production and Marketing	26.3	4.6	0.5	0.1	0.1	0.0	0.0	0.0
Industrial Processes	0.7	0.6	0.7	0.1	0.2	1.0	0.6	0.3
Total Stationary Sources	60.0	11.5	9.4	4.7	0.6	1.7	1.3	0.9
Stationary Sources Percentage of Total	43.3	14.4	3.9	7.3	4.4	3.1	4.0	6.5
Areawide Sources								
Solvent Evaporation	12.3	11.3	-	-	-	-	-	-
Miscellaneous Processes	4.6	1.6	22.2	1.7	0.1	43.5	22.2	5.4
Total Areawide Sources	17.0	12.9	22.2	1.7	0.1	43.5	22.2	5.4
Areawide Sources Percentage of Total	12.3	16.1	9.2	2.6	0.7	80.1	68.7	39.1
Mobile Sources								
On-road Motor Vehicles	11.9	11.0	97.5	17.4	0.1	1.0	1.0	0.7
Other Mobile Sources	12.7	11.7	65.9	39.4	12.3	3.3	3.2	3.0
Total Mobile Sources	24.6	22.7	163.3	56.8	12.4	4.3	4.1	3.6
Mobile Sources Percentage of Total	17.7	28.3	67.9	87.9	91.9	7.9	12.7	26.1
Natural Sources								
Natural (Non-man Made) Sources	37.0	33.0	45.6	1.4	0.4	4.8	4.6	3.9
Total Natural Sources	37.0	33.0	45.6	1.4	0.4	4.8	4.6	3.9
Natural Sources Percentage of Total	26.7	41.2	19.0	2.2	3.0	8.8	14.2	28.3
Grand Total	**138.6**	**80.1**	**240.5**	**64.6**	**13.5**	**54.3**	**32.3**	**13.8**

Notes:
CO = carbon monoxide
NOx = nitrogen oxides
PM = particulate matter
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
SOx = sulfur oxides
TOG = total organic gas
VOC = volatile organic compound

Source: ARB (2011a)

TABLE H-4
Estimated Annual Average Emissions for Los Angeles County (tons per day)
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Source Category	TOG	VOC	CO	NOx	SOx	PM	PM_{10}	$PM_{2.5}$
Stationary Sources								
Fuel Combustion	17.8	4.3	24.1	30.5	6.4	4.1	4.0	3.9
Waste Disposal	16.5	0.9	0.8	1.6	0.4	0.8	0.4	0.2
Cleaning and Surface Coatings	32.9	25.8	0.0	0.1	0.0	0.5	0.4	0.4
Petroleum Production and Marketing	34.5	25.1	8.9	4.4	6.6	3.8	2.5	2.1
Industrial Processes	12.8	11.6	1.3	2.8	2.9	35.9	17.6	5.6
Total Stationary Sources	114.5	67.7	35.0	39.2	16.4	45.1	24.8	12.1
Stationary Sources Percentage of Total	23.7	17.3	1.9	7.6	32.3	13.1	12.7	16.9
Areawide Sources								
Solvent Evaporation	94.6	82.7	-	-	-	0.0	0.0	0.0
Miscellaneous Processes	13.1	5.4	51.2	14.1	0.4	263.7	135.7	30.8
Total Areawide Sources	107.7	88.0	51.2	14.1	0.4	263.7	135.7	30.8
Areawide Sources Percentage of Total	22.3	22.5	2.8	2.7	0.8	76.4	69.3	42.9
Mobile Sources								
On-road Motor Vehicles	124.3	113.1	1,096.3	248.3	1.3	15.3	15.1	11.0
Other Mobile Sources	89.1	81.0	579.5	210.1	32.0	14.1	13.6	12.4
Total Mobile Sources	213.4	194.1	1,675.8	458.4	33.3	29.4	28.8	23.3
Mobile Sources Percentage of Total	44.2	49.7	91.7	89.2	65.7	8.5	14.7	32.5
Natural Sources								
Natural (Non-man Made) Sources	46.8	40.5	65.0	1.9	0.6	6.8	6.6	5.6
Total Natural Sources	46.8	40.5	65.0	1.9	0.6	6.8	6.6	5.6
Natural Sources Percentage of Total	9.7	1.3	3.6	0.4	1.2	2.0	3.4	7.8
Grand Total	**482.3**	**390.3**	**1,827.1**	**513.7**	**50.7**	**345.1**	**195.9**	**71.8**

Notes:
CO = carbon monoxide
NOx = nitrogen oxides
PM = particulate matter
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
SOx = sulfur oxides
TOG = total organic gas
VOC = volatile organic compound

Source: ARB (2011a)

TABLE H-5
Estimated Annual Average Emissions for Kern County (tons per day)
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Source Category	TOG	VOC	CO	NOx	SOx	PM	PM_{10}	$PM_{2.5}$
Stationary Sources								
Fuel Combustion	28.1	8.4	18.0	27.1	4.5	4.6	4.3	4.2
Waste Disposal	28.1	0.3	0.1	0.0	0.0	0.2	0.1	0.0
Cleaning and Surface Coatings	2.5	2.3	0.0	-	-	0.0	0.0	0.0
Petroleum Production and Marketing	69.3	28.8	1.1	0.4	0.2	0.2	0.2	0.1
Industrial Processes	2.5	2.2	9.4	18.4	3.3	15.4	9.4	3.9
Total Stationary Sources	130.4	42.1	28.6	45.9	8.0	20.4	14.0	8.3
Stationary Sources Percentage of Total	43.7	30.1	7.7	23.3	85.1	13.8	16.1	24.7
Areawide Sources								
Solvent Evaporation	15.0	14.0	-	-	-	-	-	-
Miscellaneous Processes	66.5	7.4	30.2	2.3	0.1	112.3	58.0	11.8
Total Areawide Sources	81.5	21.3	30.2	2.3	0.1	112.3	58.0	11.8
Areawide Sources Percentage of Total	27.3	15.2	8.2	1.2	1.1	75.7	66.5	35.1
Mobile Sources								
On-road Motor Vehicles	21.4	19.3	166.1	111.4	0.2	5.0	4.9	4.1
Other Mobile Sources	14.3	12.8	87.4	35.2	0.5	4.6	4.5	4.3
Total Mobile Sources	35.7	32.1	253.5	146.5	0.7	9.6	9.4	8.4
Mobile Sources Percentage of Total	12.0	23.0	68.5	74.5	7.4	6.5	10.8	25.0
Natural Sources								
Natural (Non-man Made) Sources	50.6	44.2	57.7	1.8	0.6	6.1	5.9	5.0
Total Natural Sources	50.6	44.2	57.7	1.8	0.6	6.1	5.9	5.0
Natural Sources Percentage of Total	17.0	31.6	15.6	0.9	6.4	4.1	6.8	14.9
Grand Total	**298.2**	**139.8**	**370.0**	**196.6**	**9.4**	**148.3**	**87.2**	**33.6**

Notes:
CO = carbon monoxide
NOx = nitrogen oxides
PM = particulate matter
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
SOx = sulfur oxides
TOG = total organic gas
VOC = volatile organic compound

Source: ARB (2011a)

Local Setting

A summary of ambient criteria pollutant concentrations at air quality monitoring stations near SSFL, as identified in Section 3.5, is provided in Table H-6.

TABLE H-6
Ambient Criteria Pollutant Concentrations at Air Quality Monitoring Stations near SSFL
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Pollutant	Standard / Exceedance	Simi Valley			Reseda			Burbank		
		2008	2009	2010	2008	2009	2010	2008	2009	2010
Ozone [a]	Year Coverage	98	99	99	99	97	97	98	98	93
	Maximum 8-hour Concentration (ppm)	0.095	0.092	0.087	0.103	0.100	0.092	0.110	0.097	0.084
	Maximum 1-hour Concentration (ppm)	0.115	0.116	0.098	0.123	0.135	0.122	0.133	0.145	0.111
	# Days > Federal 8-hour Standard of 0.075 ppm	27	24	8	25	19	19	17	14	4
PM_{10}	Year Coverage	100	100	94	NM	NM	NM	86	97	95
	Annual Average (µg/m^3)	26.6	26.0	19.1	NM	NM	NM	35.6	39.2	27.5
	Maximum 24-hour Concentration (µg/m^3)	83.6	76.8	35.2	NM	NM	NM	66.0	80.0	51.0
	# Days > Federal 24-hour Standard of 150 µg/m^3	0	0	0	NM	NM	NM	0	0	0
$PM_{2.5}$	Year Coverage	97	100	99	92	91	82	95	100	100
	Annual Average (µg/m^3)	10.7	10.2	8.7	11.8	11.3	NA	13.9	15.3	12.7
	Maximum 24-hour Concentration (µg/m^3)	61.1	36.0	42.4	50.5	54.4	50.3	68.9	67.5	43.7
	# Days > Federal 24-hour Standard of 35 µg/m^3	1	0	0	2	1	1	2	11	4
CO [a]	Year Coverage	NM	NM	NM	97	97	99	97	97	85
	Maximum 8-hour Concentration (ppm)	NM	NM	NM	2.88	3.31	2.60	2.48	2.89	2.35
	Maximum 1-hour Concentration (ppm)	NM	NM	NM	3.4	NA	NA	3.0	NA	NA
	# Days > Federal 8-hour Standard of 9 ppm	NM	NM	NM	0	0	0	0	0	0
	# Days > Federal 1-hour Standard of 35 ppm	NM	NM	NM	0	NA	NA	0	NA	NA
NO_2	Year Coverage	98	100	99	97	99	99	97	85	76
	Annual Average (ppm)	0.012	0.011	0.010	0.018	0.017	0.017	0.029	0.027	0.024
	Maximum 1-hour Concentration (ppm)	0.077	0.047	0.069	0.091	0.070	0.075	0.105	0.088	0.082

TABLE H-6
Ambient Criteria Pollutant Concentrations at Air Quality Monitoring Stations near SSFL
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Pollutant	Standard / Exceedance	Simi Valley			Reseda			Burbank		
		2008	2009	2010	2008	2009	2010	2008	2009	2010
SO_2 [b]	Year Coverage	NM	NM	NM	NM	NM	NM	97	49	83
	Maximum 24-hour Concentration (ppm)	NM	NM	NM	NM	NM	NM	0.003	0.003	0.004
	Maximum 3-hour Concentration (ppm)	NM	NM	NM	NM	NM	NM	0.005	NA	NA
	Maximum 1-hour Concentration (ppm)	NM	NM	NM	NM	NM	NM	0.006	NA	NA
	# Days > Federal 3-hour Standard of 0.5 ppm	NM	NM	NM	NM	NM	NM	0	NA	NA

Notes:
CO = carbon monoxide
$\mu g/m^3$ = micrograms per cubic meter
NA = not available
NM = not monitored
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
ppm = parts per million
SO_2 = sulfur dioxide

[a] Year Coverage is for the 8-hour standard.
[b] Year Coverage is for the 24-hour standard.

Sources: EPA (2011); ARB (2011b)

Demolition and Excavation

To evaluate the potential impact to air quality and climate change from demolition and remediation activities, criteria pollutant and GHG emissions were estimated from equipment operation associated with demolition, excavation, and road repairs; truck travel associated with material and equipment hauling; and worker commutes. Fugitive dust emissions were also estimated as a result of demolition and earthmoving activities. Although the EIS analyzes the potential air quality and GHG emissions related to numerous soil and groundwater remedial technologies, a quantitative analysis was developed based on the Excavation and Offsite Disposal technology to represent the highest levels of potential emissions. As discussed in Section 4.7, two soil removal estimates were quantitatively considered under the Excavation and Offsite Disposal technology. The high soil removal estimate assumes that the contaminated soil will be untreatable and must all be removed, whereas the low soil removal estimate assumes that, in certain areas, soil 2 feet or more below the ground surface will be treatable such that the soil removal volume will be reduced.

For each phase evaluated, activities were expected to occur five days per week and up to 10 hours per day, based on SSFL's daily operational schedule of 7 a.m. to 7 p.m. NASA provided a site-specific equipment list for demolition activities. In the absence of site-specific data for excavation and road repair activities, equipment lists were pulled from the *California Emissions Estimator Model (CalEEMod) User's Guide* (Environ International Corporation [Environ], 2011) and the Sacramento Metropolitan Air Quality Management District's (SMAQMD) Road Construction Emissions Model (Version 6.3.2) (SMAQMD, 2009), respectively. For excavation, the maximum possible equipment counts for grading were assumed[1]; for road repairs, the road characteristics and repair durations were used as input to the Road Construction Emissions Model.

Direct emissions from off-road construction equipment were calculated using emission factors from the California Air Resources Board's (ARB) OFFROAD 2007 (version 2.0.1.2) model (ARB, 2006b) and the equipment hours of operation. These emission factors[2] were obtained from the *CalEEMod User's Guide*, based on the average equipment horsepower ratings presented[3] (Environ, 2011). Unless otherwise noted, off-road construction equipment contributes to onsite emissions.

Direct emissions from on-road vehicles, including haul trucks and worker vehicles, were calculated using emission factors from the ARB's EMFAC2007 (Version 2.3) model (ARB, 2006a) and the vehicle miles traveled (VMT) by each vehicle. The emission factors from EMFAC2007 were generated using the following model parameters:

- A vehicle speed of 15 miles per hour (mph) for onsite activities
- A vehicle speed of 55 mph for offsite activities
- A temperature of 70 degrees Fahrenheit (°F)
- A relative humidity of 60 percent

On-road vehicles contribute to both onsite and offsite emissions. The VMT for onsite vehicles, including 15-passenger vans[4], supervisory vehicles, and flatbed and dump trucks, was determined by estimating the round trip distance between the activity locations and the SSFL entrance. The VMT for offsite vehicles, including haul trucks and workers, was determined by assuming particular haul routes to the potential offsite disposal locations identified in Section 4.7 and particular routes for commuting to work assuming crew members live within 20 miles of SSFL (50 percent in Ventura County and 50 percent in Los Angeles County), respectively. The crew size expected for each construction phase is included in Table H-7.

[1] Equipment list was obtained from Table 3.2 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[2] Emission factors were obtained from Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[3] Horsepower ratings were obtained from Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[4] It was assumed that crew members would be transported around SSFL using 15-passenger vans.

TABLE H-7
Crew Sizes
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

Construction Phase	Crew Size	Source
Demolition	34	Site-specific information
Excavation / Material Hauling	15	Assumed to allow for at least one crew member per equipment
Road Repairs	30	Estimated using the SMAQMD Roadway Construction Emissions Model
Note: SMAQMD = Sacramento Metropolitan Air Quality Management District		

Since OFFROAD 2007 and EMFAC2007 do not provide emission factors for lead, an emission factor for diesel stationary and portable internal combustion engines was assumed representative of off-road construction equipment and on-road vehicles. This emission factor[5] was obtained from the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). To make the emission factor units compatible with the available equipment or vehicle data, the following assumptions were used:

- For construction equipment, assumed a diesel fuel consumption rate of 0.066 gallons per brake-horsepower hour[6], which is a generally accepted value for compliance reporting.
- For on-road vehicles, assumed a passenger vehicle gasoline fuel economy of 33.7 miles per gallon (mpg)[7], a pick-up truck gasoline fuel economy of 25.1 mpg[7], and a heavy-heavy duty truck diesel fuel economy of 6.064 mph[8].

Fugitive dust emissions of particulate matter having an aerodynamic equivalent diameter of 10 microns or less (PM_{10}) and particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less ($PM_{2.5}$) were estimated using source specific data for the following sources:

- Demolition activities: Using the volume of buildings and structures demolished on a daily basis.
- Loading debris into haul trucks: Using the mass of debris generated by demolition on a daily basis.
- Open stockpiles: Using the total area covered by stockpiles.
- Loading material into haul trucks: Using a daily quantity of material handled, determined based on the total material excavated and backfilled, and the activity duration.
- Excavation activities: Using a daily quantity of material handled, determined based on the total material excavated and backfilled, the activity duration, and the total area disturbed during excavation.

Default emission factors[9] from the *California Environmental Quality Act (CEQA) Handbook* (SCAQMD, 1993) were used for demolition activities and open stockpiles. A default emission factor[10] for debris loading was taken from the *CalEEMod User's Guide* (Environ, 2011). Per the *CEQA Handbook* (SCAQMD, 1993), a site-specific emission factor was estimated for material loading activities[11] assuming an average wind speed of 2.69 meters per

[5] The emission factor of 0.0083 pounds per 1,000 gallons was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010).

[6] The diesel fuel consumption rate was obtained from Table A9-8-C of the *CEQA Handbook* (SCAQMD, 1993).

[7] The gasoline fuel economies for passenger vehicles and pick-up trucks were obtained from Table 4-23 of the *National Transportation Statistics* (Bureau of Transportation Statistics [BTS], 2011).

[8] The diesel fuel economy for heavy-heavy duty trucks was calculated in EMFAC2007, using the model parameters documented previously.

[9] Default emission factors for demolition and open stockpiles were obtained from Table A9-9 of the *CEQA Handbook* (SCAQMD, 1993).

[10] The emission factor of 0.020 pounds per ton (lbs/ton) was obtained from Appendix A of the *CalEEMod User's Guide* (Environ, 2011).

[11] The site-specific emission factor was developed based on Table A9-9-G of the *CEQA Handbook* (SCAQMD, 1993).

second[12] and dry soil moisture conditions. Default emission factors[13] from the *Software User's Guide: URBEMIS2007 for Windows* (JSA, 2007) were used for excavation activities, assuming a low level of activity detail.

For all construction-related activities, $PM_{2.5}$ emissions were assumed to be 20.8 percent of the PM_{10} emissions, per the *Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006). Unless otherwise noted, fugitive dust emissions (PM_{10} and $PM_{2.5}$) contribute to onsite emissions.

Following the methodology discussed for construction activities, GHG emissions from off-road equipment were calculated using carbon dioxide (CO_2) and methane (CH_4) emission factors from ARB's OFFROAD 2007 model and equipment hours of operation. GHG emissions from on-road vehicles were calculated using CO_2 and CH_4 emission factors from ARB's EMFAC2007 model, based on vehicle speed, type, and analysis year, and estimated VMT.

The complete set of data used to estimate construction emissions for the EIS, as well as the emissions calculations, are captured in the *Air Quality Analysis Workbooks*, which are included in Attachments 1 and 2 of this memorandum. Note that Attachment 1 presents the results for the high soil removal estimate; Attachment 2 presents the results for the low soil removal estimate, excluding any parameters and emissions previously provided in Attachment 1 that are not affected by the soil removal volume.

Operation of Remedial Technologies

To determine the potential impact to air quality and climate change from operation of the remedial technologies, a screening assessment was performed. Technologies that would require a significant power source, use combustion, generate fugitive dust or volatile organic compound (VOC) emissions, or rely on heavy duty trucks or equipment, were evaluated qualitatively based on preliminary engineering data or industry standard practices. Additionally, the operational duration for each remedial technology was considered in this evaluation.

References

Bureau of Transportation Statistics (BTS). 2011. National Transportation Statistics. http://www.google.com/url?sa=t&rct=j&q=2011%20national%20transportation%20statistics&source=web&cd=3&ved=0CEIQFjAC&url=http%3A%2F%2Fwww.bts.gov%2Fpublications%2Fnational_transportation_statistics%2Fpdf%2Fentire.pdf&ei=pIbvTqm5NaTIsQLL6cD2BQ&usg=AFQjCNGlolJM8DalGX2iKIT44bxk3bvkww. Accessed December 15.

California Air Resources Board (ARB). 2006a. EMFAC2007 (version 2.3). November.

California Air Resources Board (ARB). 2006b. OFFROAD 2007 (version 2.0.1.2). December.

California Air Resources Board (ARB). 2010. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Updated September 8, 2010. Accessed November 1, 2011.

California Air Resources Board (ARB). 2011a. 2009 *Almanac Emission Projection Data.* http://www.arb.ca.gov/app/emsinv/emssumcat.php. Accessed November 28, 2011.

California Air Resources Board (ARB). 2011b. *Top 4 Summary Pollutant / Year Range Selection.* http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed November 2, 2011.

Environ International Corporation (Environ). 2011. California Emissions Estimator Model User's Guide. Version 2011.1. February.

Jones & Stokes Associates (JSA). 2007. *Software User's Guide: URBEMIS2007 for Windows*. November.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2009. Road Construction Emissions Model (Version 6.3.2). November.

[12] Wind speed taken as the average for the years 2002 through 2006, as measured at a meteorological tower located at SSFL and operated by Boeing.

[13] Default emission factors for excavation activities were obtained from Table A-4 of Appendix A of the *Software User's Guide: URBEMIS2007 for Windows* (JSA, 2007).

South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook*. April.

South Coast Air Quality Management District (SCAQMD). 2006. *Final – Methodology to Calculate Particulate Matter (PM) 2.5 and $PM_{2.5}$ Significance Thresholds*. October.

South Coast Air Quality Management District (SCAQMD). 2010. *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory*. January.

U.S. Environmental Protection Agency (EPA). 2011. *Air Data: Monitor Values Report – Criteria Air Pollutants.*
U.S. Environmental Protection Agency (EPA). 2012. *Green Book*.
http://www.epa.gov/oaqps001/greenbk/index.html . Updated August 31, 2011. Accessed February 8, 201

This page intentionally left blank.

Attachments

This page intentionally left blank.

ATTACHMENT 1-1

General Conformity Estimates for Demolition, Excavation, and Offsite Disposal (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

General Conformity Estimates for the Demolition, Excavation, and Offsite Disposal

Pollutant	Pollutant Thresholds (tons/year)	High Soil Removal Annual Emissions (tons/year)		
		2014	2016	2017
South Central Coast Air Basin (SCCAB)				
VOC	50	3	2	2
CO	N/A	12	9	10
NOx	50	20	15	15
SO_2	N/A	0	0	0
PM_{10}	N/A	2	1,050	1,146
$PM_{2.5}$	N/A	1	219	239
Pb	N/A	0	0	0
South Coast Air Basin (SCAB) [a]				
VOC	10	0	2	2
CO	100	1	10	10
NOx	10	2	23	22
SO_2	100	0	0	0
PM_{10}	70	0	2	2
$PM_{2.5}$	100	0	1	1
Pb	25	0	0	0
San Joaquin Valley Air Basin (SJVAB) [a]				
VOC	10	0	1	1
CO	N/A	0	7	7
NOx	10	2	20	19
SO_2	100	0	0	0
PM_{10}	70	0	1	1
$PM_{2.5}$	100	0	1	1
Pb	N/A	0	0	0
Mojave Desert Air Basin (MDAB)				
VOC	100	N/A	2	2
CO	N/A	N/A	11	11
NOx	100	N/A	27	26
SO_2	N/A	N/A	0	0
PM_{10}	100	N/A	2	2
$PM_{2.5}$	N/A	N/A	1	1
Pb	N/A	N/A	0	0
Great Basin Valley Air Basin (GBVAB) [b]				
VOC	N/A	N/A	1	1
CO	N/A	N/A	4	4
NOx	N/A	N/A	10	10
SO_2	N/A	N/A	0	0
PM_{10}	N/A	N/A	1	1
$PM_{2.5}$	N/A	N/A	0	0
Pb	N/A	N/A	0	0
Nevada [a]				
VOC	100	N/A	5	5
CO	100	N/A	35	35
NOx	100	N/A	74	71
SO_2	100	N/A	0	0
PM_{10}	70	N/A	4	4
$PM_{2.5}$	N/A	N/A	3	3
Pb	N/A	N/A	0	0
Utah				
VOC	N/A	N/A	1	1
CO	N/A	N/A	5	5
NOx	N/A	N/A	10	10
SO_2	100	N/A	0	0
PM_{10}	N/A	N/A	1	1
$PM_{2.5}$	N/A	N/A	0	0
Pb	N/A	N/A	0	0

Notes:

Red shaded cells indicate that the general conformity threshold is exceeded

[a] The minimum general conformity threshold was assigned for each pollutant within air basins that have multiple affected counties.

[b] GBVAB has attainment for all pollutants considered.

ATTACHMENT 1-1

General Conformity Estimates for Demolition, Excavation, and Offsite Disposal (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

General Conformity Thresholds

State or California Air Basin	SCCAB		SCAB				MDAB		SJVAB				Nevada				Utah	
Pollutant	Federal Attainment Status / General Conformity *De Minimis* Threshold Values (tons/year) [a, b]																	
	Ventura		Los Angeles		San Bernardino				Kern		Kings		Clark		White Pine		Tooele	
Ozone	Serious N	50	Extreme N	10	Extreme N	10	Moderate N [c]	100	Extreme N	10	Extreme N	10	Former Subpart	100	A	N/A	A	N/A
Ozone Precursor (NOx)	Serious N	50	Extreme N	10	Extreme N	10	Moderate N [c]	100	Extreme N	10	Extreme N	10	Former Subpart	100	A	N/A	A	N/A
Ozone Precursor (VOC)	Serious N	50	Extreme N	10	Extreme N	10	Moderate N [c]	100	Extreme N	10	Extreme N	10	Former Subpart	100	A	N/A	A	N/A
PM_{10}	A	N/A	Serious N	70	Serious N	70	Moderate N	100	Serious N	70	M	100	Serious N	70	A	N/A	A	N/A
$PM_{2.5}$ (Direct Emissions)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
$PM_{2.5}$ Precursor (SO_2)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
$PM_{2.5}$ Precursor (NOx)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
$PM_{2.5}$ Precursor (VOC)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
CO	A	N/A	Serious M	100	Serious M	100	A	N/A	A	N/A	A	N/A	Serious M	100	A	N/A	A	N/A
NO_2	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A
SO_2	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	M	100	N	100
Lead (2008 standard)	A	N/A	N	25	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A

Notes:

A = Attainment

M = Maintenance

N = Nonattainment

N/A = Not Applicable

[a] General Conformity *de minimis* threshold values from 40 CFR Parts 51 and 93, EPA-HQ-OAR-2004-0491; FRL-8197-4.

[b] Refer to Table H-2 of Appendix H for details on which counties are in partial nonattainment, maintenance, or attainment areas.

[c] California is not located in an ozone transportation region (http://www.epa.gov/glo/fs20080317.html). As a result, the General Conformity *de minimis* threshold value for an ozone attainment status of "Moderate Nonattainment" was taken as 100 tons/year.

[d] Per 76 FR 17373, the designation status of the Clark County ozone nonattainment area remains nonattainment despite the EPA's determination that the area has attained the NAAQS. Since Clark County is not located in an ozone transportation region, the General Conformity *de minimis* threshold value of 100 tons/year was used.

ATTACHMENT 1-2

Summary of Emissions for Demolition, Excavation, and Offsite Disposal (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Equations differ from neighboring cells to incorporate fugitive dust emissions.

Demolition, Excavation, and Offsite Disposal Emissions

Emissions Location	Emissions (lbs/day)									Emissions (tons/year) [a]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb	CO_2	CH_4
Year 2014 [c]																		
SCCAB Emissions																		
Onsite	36	162	264	0	32	18	0	33,341	3	3	12	20	0	2	1	0	2,501	0
Offsite	0	1	1	0	0	0	0	298	0	0	0	0	0	0	0	0	22	0
Total	37	162	265	0	32	18	0	33,639	3	3	12	20	0	2	1	0	2,523	0
SCAB Emissions																		
Offsite	2	13	25	0	1	1	0	5,522	0	0	1	2	0	0	0	0	414	0
SJVAB Emissions																		
Offsite	1	7	20	0	1	1	0	3,779	0	0	0	2	0	0	0	0	283	0
Year 2016 [d]																		
SCCAB Emissions																		
Onsite	19	93	143	0	8,826	1,841	0	19,722	2	2	8	13	0	1,050	219	0	1,823	0
Offsite [e]	2	12	21	0	3	1	0	5,091	0	0	1	2	0	0	0	0	532	0
Total	21	105	164	0	8,829	1,843	0	24,813	2	2	9	15	0	1,050	219	0	2,355	0
SCAB Emissions																		
Offsite [e]	21	123	240	1	32	16	0	55,634	1	2	10	23	0	2	1	0	5,784	0
MDAB Emissions																		
Offsite	15	88	230	1	13	11	0	63,328	1	2	11	27	0	2	1	0	7,547	0
SJVAB Emissions																		
Offsite	11	61	164	0	9	8	0	40,102	1	1	7	20	0	1	1	0	4,779	0
GBVAB Emissions																		
Offsite	5	30	87	0	5	4	0	18,916	0	1	4	10	0	1	0	0	2,254	0
Nevada Emissions																		
Offsite	41	296	625	1	36	29	0	153,021	2	5	35	74	0	4	3	0	18,235	0
Utah Emissions																		
Offsite	6	40	85	0	5	4	0	20,814	0	1	5	10	0	1	0	0	2,480	0
Year 2017 [d]																		
SCCAB Emissions																		
Onsite	18	90	131	0	8,825	1,841	0	19,722	2	2	9	13	0	1,146	239	0	1,984	0
Offsite [e]	2	11	19	0	3	1	0	5,104	0	0	1	2	0	0	0	0	581	0
Total	20	102	150	0	8,828	1,842	0	24,826	2	2	10	15	0	1,146	239	0	2,565	0
SCAB Emissions																		
Offsite [e]	19	115	214	1	31	15	0	55,697	1	2	10	22	0	2	1	0	6,310	0
MDAB Emissions																		
Offsite	13	84	201	1	12	10	0	63,321	1	2	11	26	0	2	1	0	8,232	0
SJVAB Emissions																		
Offsite	9	57	143	0	8	7	0	40,100	0	1	7	19	0	1	1	0	5,213	0
GBVAB Emissions																		
Offsite	5	28	75	0	4	4	0	18,915	0	1	4	10	0	1	0	0	2,459	0
Nevada Emissions																		
Offsite	37	270	544	1	32	26	0	153,004	2	5	35	71	0	4	3	0	19,891	0
Utah Emissions																		
Offsite	5	37	74	0	4	4	0	20,812	0	1	5	10	0	1	0	0	2,706	0

Notes:

[a] Annual emissions were scaled to account for the actual duration of construction activity within each calendar year, as documented in Attachment 1-8.

[b] Scaling was not required for the fugitive dust emissions as they were scaled in Attachment 1-5 and Attachment 1-6.

[c] Emissions presented for Year 2014 are associated with demolition activities.

[d] Emissions presented for Years 2016 and 2017 are associated with excavation, material hauling, and road repair activities.

[e] Annual emissions from road repair, an offsite activity, were scaled by the number of rebuilds per year since the emissions per rebuild were estimated in Attachment 1-6.

This page intentionally left blank.

ATTACHMENT 1-3

Summary of GHG Emissions for Demolition, Excavation, and Offsite Disposal (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Demolition, Excavation, and Offsite Disposal GHG Emissions

Emissions Location	Emissions (metric tons/year)		
	CO_2	CH_4	CO_2e [a]
Year 2014 [b]			
SCCAB Emissions			
Onsite	2,268	0	2,273
Offsite	20	0	20
Total	2,289	0	2,293
SCAB Emissions			
Offsite	376	0	376
SJVAB Emissions			
Offsite	257	0	257
Total Year 2014	**2,922**	**0**	**2,926**
Year 2016 [c]			
SCCAB Emissions			
Onsite	1,654	0	1,656
Offsite	482	0	483
Total	2,136	0	2,139
SCAB Emissions			
Offsite	5,247	0	5,249
MDAB Emissions			
Offsite	6,846	0	6,848
SJVAB Emissions			
Offsite	4,335	0	4,336
GBVAB Emissions			
Offsite	2,045	0	2,046
Nevada Emissions			
Offsite	16,543	0	16,547
Utah Emissions			
Offsite	2,250	0	2,251
Total Year 2016	**39,403**	**1**	**39,416**
Year 2017 [c]			
SCCAB Emissions			
Onsite	1,799	0	1,802
Offsite	527	0	527
Total	2,327	0	2,330
SCAB Emissions			
Offsite	5,725	0	5,726
MDAB Emissions			
Offsite	7,468	0	7,469
SJVAB Emissions			
Offsite	4,729	0	4,730
GBVAB Emissions			
Offsite	2,231	0	2,231
Nevada Emissions			
Offsite	18,045	0	18,049
Utah Emissions			
Offsite	2,454	0	2,455
Total Year 2017	**42,978**	**1**	**42,992**

Notes:

[a] CO_2e emissions were estimated using the following global warming potentials: 1 for CO_2 and 21 for CH_4.

[b] Emissions presented for Year 2014 are associated with demolition activities.

[c] Emissions presented for Years 2016 and 2017 are associated with excavation, material hauling, and road repair activities.

This page intentionally left blank.

ATTACHMENT 1-4

Demolition Emissions (High and Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Construction Equipment Emissions

Construction Equipment	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Year 2014																		
Excavators	5.662	33.263	41.579	0.059	2.279	2.279	0.002	5,605.939	0.503	0.425	2.495	3.118	0.004	0.171	0.171	0.000	420.445	0.038
Crawler Cranes [c]	0.978	2.814	9.080	0.012	0.315	0.315	0.000	1,120.561	0.087	0.073	0.211	0.681	0.001	0.024	0.024	0.000	84.042	0.007
All-Terrain Cranes [c]	1.956	5.627	18.160	0.024	0.631	0.631	0.001	2,241.123	0.174	0.147	0.422	1.362	0.002	0.047	0.047	0.000	168.084	0.013
Manlifts [d]	1.041	3.353	3.511	0.005	0.279	0.279	0.000	391.896	0.094	0.078	0.251	0.263	0.000	0.021	0.021	0.000	29.392	0.007
Wheel Loaders [e]	1.800	8.230	11.298	0.012	0.951	0.951	0.001	1,177.193	0.162	0.135	0.617	0.847	0.001	0.071	0.071	0.000	88.289	0.012
Off-highway Trucks	4.127	12.257	31.857	0.048	1.130	1.130	0.002	5,441.688	0.364	0.310	0.919	2.389	0.004	0.085	0.085	0.000	408.127	0.027
Dozers [f]	3.064	13.290	25.564	0.023	1.057	1.057	0.001	2,646.299	0.275	0.230	0.997	1.917	0.002	0.079	0.079	0.000	198.472	0.021
Vacuum Trucks [g]	2.063	6.128	15.929	0.024	0.565	0.565	0.001	2,720.844	0.182	0.155	0.460	1.195	0.002	0.042	0.042	0.000	204.063	0.014
Motor Graders [h]	1.383	7.324	10.501	0.013	0.575	0.575	0.001	1,238.080	0.124	0.104	0.549	0.788	0.001	0.043	0.043	0.000	92.856	0.009
Skid-steer Loaders	1.769	8.777	8.635	0.013	0.537	0.537	0.000	1,019.831	0.160	0.133	0.658	0.648	0.001	0.040	0.040	0.000	76.487	0.012
Miscellaneous Small Equipment [i, j]	12.350	58.986	85.939	0.099	6.627	6.627	0.004	9,345.361	1.102	0.926	4.424	6.445	0.007	0.497	0.497	0.000	700.902	0.083
Total Onsite (Within the SCCAB) [k]	**36.195**	**160.049**	**262.052**	**0.331**	**14.945**	**14.945**	**0.014**	**32,948.815**	**3.225**	**2.715**	**12.004**	**19.654**	**0.025**	**1.121**	**1.121**	**0.001**	**2,471.161**	**0.242**

Notes:

[a] Daily Emissions (lbs/day) = Emission Factor (g/bhp-hr) x Quantity X Horsepower x Load Factor x Hours of Operation per Day / 453.6 (g/lb).

[b] Annual emissions were estimated assuming activities occur 150 days per year, as documented in Attachment 1-7.

[c] Emissions for Crawler Cranes and All-Terrain Cranes were estimated using emission factors for 'Cranes'.

[d] Emissions for Manlifts were estimated using emission factors for 'Aerial Lifts'.

[e] Emissions for Wheel Loaders were estimated using emission factors for 'Rubber Tired Loaders'.

[f] Emissions for Dozers were estimated using emission factors for 'Rubber Tired Dozers'.

[g] Emissions for Vacuum Trucks were estimated using emission factors for 'Off-highway Trucks'.

[h] Emissions for Motor Graders were estimated using emission factors for 'Graders'.

[i] Emissions for Miscellaneous Small Equipment were estimated using emission factors for 'Pumps'.

[j] While Miscellaneous Small Equipment may include compressors, lighting, pumps, etc., emissions were estimated assuming all equipment were pumps.

[k] All construction activities occur onsite, which is located within the SCCAB.

Construction Equipment Emission Factors

Construction Equipment	Emission Factors (g/bhp-hr) [a]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb [b, c]	CO_2	CH_4
Year 2014									
Excavators	0.574	3.372	4.215	0.006	0.231	0.231	0.0002	568.299	0.051
Cranes	0.496	1.427	4.605	0.006	0.16	0.16	0.0002	568.299	0.044
Aerial Lifts	1.51	4.862	5.091	0.007	0.404	0.404	0.0002	568.299	0.136
Rubber Tired Loaders	0.869	3.973	5.454	0.006	0.459	0.459	0.0002	568.300	0.078
Off-highway Trucks	0.431	1.28	3.327	0.005	0.118	0.118	0.0002	568.299	0.038
Rubber Tired Dozers	0.658	2.854	5.49	0.005	0.227	0.227	0.0002	568.299	0.059
Graders	0.635	3.362	4.82	0.006	0.264	0.264	0.0002	568.299	0.057
Skid-steer Loaders	0.986	4.891	4.812	0.007	0.299	0.299	0.0002	568.299	0.089
Pumps	0.751	3.587	5.226	0.006	0.403	0.403	0.0002	568.299	0.067

Notes:

[a] Emission factors were obtained from Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[b] A lead emission factor for stationary and portable internal combustion engines was assumed representative of construction equipment. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010): 0.0083 lbs/1,000 gallons

[c] For construction equipment, assumed the following diesel fuel consumption per Table A9-8-C of the *CEQA Handbook* (SCAQMD, 1993): 0.066 gallons/bhp-hr

ATTACHMENT 1-4
Demolition Emissions (High and Low Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Fugitive Dust Emissions From Demolition

Fugitive Dust	Emissions (lbs/day)		Emissions (tons/year) [b]	
	PM_{10}	$PM_{2.5}$ [a]	PM_{10}	$PM_{2.5}$
Year 2014				
Demolition Fugitive Dust [c]	3.687	0.767	0.277	0.058
Debris Loading Fugitive Dust [d]	12.794	2.661	0.960	0.200
Total Onsite (Within the SCCAB) [e]	**16.481**	**3.428**	**1.236**	**0.257**

Notes:

[a] Per Appendix A of the *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006), $PM_{2.5}$ emissions from construction activities were assumed to be: 20.8% of the PM_{10} emissions

[b] Annual emissions were estimated assuming activities occur 150 days per year, as documented in Attachment 1-7.

[c] Demolition Fugitive Dust emissions were calculated using Table A9-9-H from the *CEQA Handbook* (SCAQMD, 1993) as follows:

Daily PM_{10} Emissions (lbs/day) = Emission Factor (lb PM_{10}/ft^3) x Volume Handled per Day (ft^3/day).

PM_{10} Emission Factor (lbs/ft^3) is: 0.00042

[d] Emission factor for debris loading was calculated per Appendix A of the *CalEEMod User's Guide* (Environ, 2011) as follows:

Daily PM_{10} Emissions (lbs/day) = Emission Factor (lbs PM_{10}/ton) x Quantity Handled per Day (tons/day)

PM_{10} Emission Factor (lbs/ton) is: 0.020

[e] All construction activities occur onsite, which is located within the SCCAB.

Vehicle Emissions

Vehicle Type	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Onsite Emissions for Year 2014 [c]																		
Crew Vans [d]	0.002	0.039	0.003	0.000	0.001	0.000	0.000	10.031	0.001	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.752	0.000
Supervisory Vehicles [e]	0.006	0.141	0.012	0.000	0.002	0.002	0.000	24.956	0.002	0.000	0.011	0.001	0.000	0.000	0.000	0.000	1.872	0.000
Tractor-trailer End Dump Trucks (25 ton) [f]	0.110	0.493	0.574	0.001	0.030	0.026	0.000	133.861	0.005	0.008	0.037	0.043	0.000	0.002	0.002	0.000	10.040	0.000
Standard Tractor-trailer Flatbeds [f]	0.037	0.164	0.191	0.000	0.010	0.009	0.000	44.620	0.002	0.003	0.012	0.014	0.000	0.001	0.001	0.000	3.347	0.000
Tractor-trailer End Dump Trucks (25 ton) [f]	0.147	0.657	0.765	0.002	0.040	0.034	0.000	178.481	0.007	0.011	0.049	0.057	0.000	0.003	0.003	0.000	13.386	0.001
Total Onsite (Within the SCCAB)	**0.302**	**1.494**	**1.546**	**0.004**	**0.083**	**0.071**	**0.000**	**391.950**	**0.016**	**0.023**	**0.112**	**0.116**	**0.000**	**0.006**	**0.005**	**0.000**	**29.396**	**0.001**
Offsite Emissions for Year 2014 [c]																		
Travel Within the SCCAB																		
Tractor-trailer End Dump Trucks (25 ton) [f, g]	0.007	0.052	0.102	0.000	0.005	0.004	0.000	21.279	0.000	0.001	0.004	0.008	0.000	0.000	0.000	0.000	1.596	0.000
Standard Tractor-trailer Flatbeds [f, h]	0.002	0.017	0.034	0.000	0.002	0.001	0.000	7.093	0.000	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.532	0.000
Tractor-trailer End Dump Trucks (25 ton) [f, i]	0.006	0.043	0.085	0.000	0.004	0.004	0.000	17.733	0.000	0.000	0.003	0.006	0.000	0.000	0.000	0.000	1.330	0.000
Tractor-trailer End Dump Trucks (25 ton) [f, j]	0.054	0.416	0.814	0.002	0.041	0.034	0.000	170.233	0.003	0.004	0.031	0.061	0.000	0.003	0.003	0.000	12.767	0.000
Worker Commute [k]	0.008	0.325	0.031	0.001	0.007	0.004	0.000	81.810	0.003	0.001	0.024	0.002	0.000	0.001	0.000	0.000	6.136	0.000
Total Offsite (Within the SCCAB)	**0.077**	**0.854**	**1.065**	**0.003**	**0.060**	**0.047**	**0.000**	**298.148**	**0.007**	**0.006**	**0.064**	**0.080**	**0.000**	**0.005**	**0.004**	**0.000**	**22.361**	**0.001**
Travel Within the SCAB																		
Tractor-trailer End Dump Trucks (25 ton) [f, g]	0.528	3.245	7.967	0.015	0.424	0.355	0.001	1,532.447	0.026	0.040	0.243	0.598	0.001	0.032	0.027	0.000	114.934	0.002
Standard Tractor-trailer Flatbeds [f, h]	0.121	0.746	1.833	0.003	0.098	0.082	0.000	352.535	0.006	0.009	0.056	0.137	0.000	0.007	0.006	0.000	26.440	0.000
Tractor-trailer End Dump Trucks (25 ton) [f, i]	0.781	4.799	11.782	0.022	0.628	0.525	0.001	2,266.294	0.039	0.059	0.360	0.884	0.002	0.047	0.039	0.000	169.972	0.003
Tractor-trailer End Dump Trucks (25 ton) [f, j]	0.178	1.097	2.693	0.005	0.143	0.120	0.000	518.010	0.009	0.013	0.082	0.202	0.000	0.011	0.009	0.000	38.851	0.001
Worker Commute [k]	0.074	3.212	0.304	0.008	0.079	0.038	0.000	852.235	0.036	0.006	0.241	0.023	0.001	0.006	0.003	0.000	63.918	0.003
Total Offsite (Within the SCAB)	**1.682**	**13.099**	**24.578**	**0.054**	**1.373**	**1.120**	**0.002**	**5,521.521**	**0.116**	**0.126**	**0.982**	**1.843**	**0.004**	**0.103**	**0.084**	**0.000**	**414.114**	**0.009**

ATTACHMENT 1-4

Demolition Emissions (High and Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Travel Within the SJVAB																		
Tractor-trailer End Dump Trucks (25 ton) [f,i]	1.247	6.566	20.332	0.037	1.068	0.896	0.001	3,779.393	0.060	0.094	0.492	1.525	0.003	0.080	0.067	0.000	283.455	0.004

Notes:

[a] Daily Emissions (lbs/day) = Quantity of Vehicles x Daily VMT (miles/day) x Emission Factor (g/mile) / 453.6 (g/lb).

[b] Annual emissions were estimated assuming activities occur 150 days per year, as documented in Attachment 1-7.

[c] Onsite emissions all occur within the SCCAB; offsite emissions were distributed amongst the air basins based on the haul routes for each vehicle, as presented in Attachment 1-7.

[d] Emissions for Crew Vans were estimated using emission factors for 'Passenger Vehicles'.

[e] Emissions for Supervisory Vehicles were estimated using emission factors for 'Pick-up Trucks'.

[f] Emissions for Tractor-trailer End Dump Trucks and Standard Tractor-trailer Flatbeds were estimated using emission factors for 'Heavy-Heavy Duty Trucks'.

[g] The first Tractor-trailer End Dump Trucks listed above transport scrap metal to San Pedro for export.

[h] The Standard Tractor-trailer Flatbeds listed above transport salvaged equipment to a dealer in Los Angeles County.

[i] The second Tractor-trailer End Dump Trucks listed above transport concrete to Kettleman Hills Landfill.

[j] The third Tractor-trailer End Dump Trucks listed above transport asphalt to a facility in Simi Valley.

[k] Assumed workers live in Ventura County and Los Angeles County as listed below. It was also assumed workers commute in passenger vehicles.

Ventura County	50%
Los Angeles County	50%

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]								
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]	CO_2	CH_4
Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.092	2.211	0.157	0.005	0.043	0.027	0.0001	568.771	0.031
Pick-up Trucks [e,f]	0.178	4.009	0.353	0.007	0.063	0.046	0.0001	707.510	0.045
Heavy-Heavy Duty Trucks [g]	2.086	9.309	10.847	0.024	0.570	0.487	0.001	2,529.969	0.099
Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.031	1.240	0.120	0.003	0.028	0.014	0.0001	311.842	0.013
Pick-up Trucks [e,f]	0.063	2.304	0.281	0.004	0.035	0.020	0.0001	390.265	0.022
Heavy-Heavy Duty Trucks [g]	0.514	3.928	7.688	0.015	0.392	0.324	0.001	1,608.701	0.028
SCAB Emission Factors									
Passenger Vehicles [d]	0.027	1.174	0.111	0.003	0.029	0.014	0.0001	311.502	0.013
Pick-up Trucks [e,f]	0.048	1.836	0.217	0.004	0.036	0.021	0.0001	390.856	0.018
Heavy-Heavy Duty Trucks [g]	0.562	3.455	8.483	0.016	0.452	0.378	0.001	1,631.732	0.028
SJVAB Emission Factors									
Passenger Vehicles [d]	0.032	1.318	0.125	0.003	0.029	0.015	0.0001	311.755	0.014
Pick-up Trucks [e,f]	0.058	2.085	0.261	0.004	0.036	0.021	0.0001	390.174	0.020
Heavy-Heavy Duty Trucks [g]	0.544	2.864	8.868	0.016	0.466	0.391	0.001	1,648.397	0.026

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007 for each air basin, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all air basins, all vehicle speeds, and all construction years: 0.0083 lbs/1,000 gallons

[d] Per Table 4-23 of the *National Transportation Statistics* (BTS, 2011), assumed a passenger fuel economy of: 33.7 miles per gallon

[e] EMFAC2007 emission factors for Pick-Up Trucks assume an equal mix of LDT1 and LDT2 vehicles.

[f] Per Table 4-23 of the *National Transportation Statistics* (BTS, 2011), assumed a pick-up truck fuel economy of: 25.1 miles per gallon

[g] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-5

Excavation Emissions (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Construction Equipment Emissions

Construction Equipment	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Year 2016																		
Rubber Tired Dozers	2.789	11.665	22.361	0.023	0.913	0.913	0.000	2,646.299	0.251	0.363	1.516	2.907	0.003	0.119	0.119	0.000	344.019	0.033
Concrete/Industrial Saws	0.808	4.719	5.777	0.008	0.434	0.434	0.000	740.820	0.072	0.105	0.613	0.751	0.001	0.056	0.056	0.000	96.307	0.009
Tractors/Loaders/Backhoes	1.571	10.367	10.569	0.016	0.758	0.758	0.000	1,550.419	0.139	0.204	1.348	1.374	0.002	0.099	0.099	0.000	201.554	0.018
Graders	1.213	7.303	8.616	0.013	0.475	0.475	0.000	1,238.080	0.109	0.158	0.949	1.120	0.002	0.062	0.062	0.000	160.950	0.014
Excavators	1.941	13.281	13.112	0.024	0.706	0.706	0.000	2,242.376	0.174	0.252	1.727	1.705	0.003	0.092	0.092	0.000	291.509	0.023
Scrapers	5.459	20.185	44.325	0.057	1.695	1.695	0.000	6,422.681	0.486	0.710	2.624	5.762	0.007	0.220	0.220	0.000	834.948	0.063
Total Onsite (Within the SCCAB) [c]	**13.782**	**67.519**	**104.760**	**0.141**	**4.982**	**4.982**	**0.000**	**14,840.674**	**1.231**	**1.792**	**8.778**	**13.619**	**0.018**	**0.648**	**0.648**	**0.000**	**1,929.288**	**0.160**
Year 2017																		
Rubber Tired Dozers	2.654	10.957	20.871	0.023	0.847	0.847	0.000	2,646.299	0.237	0.345	1.424	2.713	0.003	0.110	0.110	0.000	344.019	0.031
Concrete/Industrial Saws	0.726	4.686	5.326	0.008	0.383	0.383	0.000	740.818	0.065	0.094	0.609	0.692	0.001	0.050	0.050	0.000	96.306	0.008
Tractors/Loaders/Backhoes	1.430	10.315	9.639	0.016	0.647	0.647	0.000	1,550.419	0.128	0.186	1.341	1.253	0.002	0.084	0.084	0.000	201.554	0.017
Graders	1.133	7.294	7.773	0.013	0.427	0.427	0.000	1,238.080	0.100	0.147	0.948	1.011	0.002	0.056	0.056	0.000	160.950	0.013
Excavators	1.787	13.274	11.553	0.024	0.612	0.612	0.000	2,242.376	0.158	0.232	1.726	1.502	0.003	0.080	0.080	0.000	291.509	0.021
Scrapers	5.176	19.179	40.708	0.057	1.548	1.548	0.000	6,422.681	0.463	0.673	2.493	5.292	0.007	0.201	0.201	0.000	834.948	0.060
Total Onsite (Within the SCCAB) [c]	**12.906**	**65.705**	**95.870**	**0.141**	**4.464**	**4.464**	**0.000**	**14,840.672**	**1.152**	**1.678**	**8.542**	**12.463**	**0.018**	**0.580**	**0.580**	**0.000**	**1,929.287**	**0.150**

Notes:

[a] Daily Emissions = Emission Factor (g/bhp-hr) x Equipment Quantity X Horsepower x Load Factor x Hours of Operation per Day / 453.6 (g/lb).

[b] Annual emissions assume activities occur: 260 days per year

[c] All construction activities occur onsite, which is located within the SCCAB.

Construction Equipment Emission Factors

Construction Equipment	Emission Factors (g/bhp-hr) [a]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb [b, c]	CO_2	CH_4
Year 2016									
Rubber Tired Dozers	0.599	2.505	4.802	0.005	0.196	0.196	0.0000	568.299	0.054
Concrete/Industrial Saws	0.62	3.62	4.432	0.006	0.333	0.333	0.0000	568.3	0.055
Tractors/Loaders/Backhoes	0.576	3.8	3.874	0.006	0.278	0.278	0.0000	568.299	0.051
Graders	0.557	3.352	3.955	0.006	0.218	0.218	0.0000	568.299	0.05
Excavators	0.492	3.366	3.323	0.006	0.179	0.179	0.0000	568.299	0.044
Scrapers	0.483	1.786	3.922	0.005	0.15	0.15	0.0000	568.299	0.043
Year 2017									
Rubber Tired Dozers	0.57	2.353	4.482	0.005	0.182	0.182	0.0000	568.299	0.051
Concrete/Industrial Saws	0.557	3.595	4.086	0.006	0.294	0.294	0.0000	568.299	0.05
Tractors/Loaders/Backhoes	0.524	3.781	3.533	0.006	0.237	0.237	0.0000	568.299	0.047
Graders	0.52	3.348	3.568	0.006	0.196	0.196	0.0000	568.299	0.046
Excavators	0.453	3.364	2.928	0.006	0.155	0.155	0.0000	568.299	0.04
Scrapers	0.458	1.697	3.602	0.005	0.137	0.137	0.0000	568.299	0.041

Notes:

[a] Emission factors were obtained from Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[b] A lead emission factor for stationary and portable internal combustion engines was assumed representative of construction equipment. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010): 0.0083 lbs/1,000 gallons

[c] For construction equipment, assumed the following diesel fuel consumption per Table A9-8-C of the *CEQA Handbook* (SCAQMD, 1993): 0.066 gallons/bhp-hr

ATTACHMENT 1-5
Excavation Emissions (High Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Fugitive Dust Emissions

Pollutant	Emissions (lbs/day)	Emissions (tons/year)
Year 2016		
Open Stockpile Fugitive Dust [a, b]		
PM_{10} Emissions	4,442.543	529.403
$PM_{2.5}$ Emissions [c]	924.049	110.116
Truck Loading Fugitive Dust [b, d]		
PM_{10} Emissions	2.419	0.288
$PM_{2.5}$ Emissions [c]	0.503	0.060
Earthmoving Fugitive Dust [e, f, g]		
PM_{10} Emissions	4,361.281	519.719
$PM_{2.5}$ Emissions [c]	907.146	108.102
PM_{10} Total Onsite (Within the SCCAB) [h]	**8,806.243**	**1,049.411**
$PM_{2.5}$ Total Onsite (Within the SCCAB) [h]	**1,831.699**	**218.277**
Year 2017		
Open Stockpile Fugitive Dust [a, b]		
PM_{10} Emissions	4,442.543	577.531
$PM_{2.5}$ Emissions [c]	924.049	120.126
Truck Loading Fugitive Dust [b, d]		
PM_{10} Emissions	2.419	0.315
$PM_{2.5}$ Emissions [c]	0.503	0.065
Earthmoving Fugitive Dust [e, f, g]		
PM_{10} Emissions	4,361.281	566.967
$PM_{2.5}$ Emissions [c]	907.146	117.929
PM_{10} Total Onsite (Within the SCCAB) [h]	**8,806.243**	**1,144.812**
$PM_{2.5}$ Total Onsite (Within the SCCAB) [h]	**1,831.699**	**238.121**

Notes:

[a] For open storage piles from Table A9-9 of the *CEQA Handbook* (SCAQMD, 1993), daily PM_{10} Emissions (lbs/day) = Area Covered by Storage Piles (acres) x Emission Factor (lbs/day/acre).

[b] Annual emissions for open stockpiles and truck loading were estimated assuming the entire allowable duration, as documented in Attachment 1-8.

[c] Per Appendix A of the *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006), $PM_{2.5}$ emissions from construction activities were assumed to be: 20.8% of the PM_{10} emissions

[d] For truck loading from Table A9-9 of the *CEQA Handbook* (SCAQMD, 1993), daily PM_{10} Emissions (lbs/day) = Material Handled (tons/day) x Emission Factor (lbs/ton).

[e] For earthmoving (cut/fill), daily PM_{10} Emissions (lbs/day) = Area Excavated (acres) / Monthly Schedule (days/month) x Construction Activity Emission Factor (lbs/acre-month) + Daily Material Handled (tons/day) / Material Density (tons/cy) x Onsite Cut/Fill Emission Factor (lbs/1,000 cy).

[f] For earthmoving (cut/fill), made the following assumptions:

Material Density:	1.34	tons/cy	(documented in Attachment 1-8)
Monthly Schedule:	22	days per month	(consistent with the schedule documented in Attachment 1-6)

[g] Annual emissions for earthmoving were estimated assuming the same duration as excavation activities, as documented in Attachment 1-8.

[h] All construction activities occur onsite, which is located within the SCCAB.

ATTACHMENT 1-5
Excavation Emissions (High Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Fugitive Dust Emission Factors

Construction Element	Emission Factors	
	PM_{10}	Units
Open Stockpile Fugitive Dust [a]	85.6	lbs/day/acre
Truck Loading Fugitive Dust [b]	0.0014	lbs/ton
Earthmoving Fugitive Dust [c]		
Construction Activity	0.11	ton/acre-month
	220	lbs/acre-month
Onsite Cut/Fill	0.059	ton/1,000 cy
	118	lbs/1,000 cy

Notes:

[a] Default emission factor for open storage piles from Table A9-9 from the *CEQA Handbook* (SCAQMD, 1993).

[b] Emission factor for truck loading was calculated using Table A9-9-G from the *CEQA Handbook* (SCAQMD, 1993) as follows:

Emission Factor (lbs/ton) = 0.00112 x {[(Average Wind Speed / 5) ^ 1.3] / [(Dirt Moisture Content / 2) ^ 1.4]}

Average Wind Speed:	6.0	mph	(value of 2.69 m/s, as measured onsite)
Dirt Moisture Content:	2.0	%	(assumed dry soil)

[c] Default emission factor for earthmoving (cut/fill) from Table A-4 of Appendix A of the *Software User's Guide: URBEMIS2007 for Windows* (JSA, 2007).

Vehicle Emissions

Vehicle Type	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Onsite Emissions for Year 2016 [c]																		
Crew Vans [d]	0.001	0.016	0.001	0.000	0.000	0.000	0.000	4.994	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.649	0.000
Offsite Emissions for Year 2016 [c]																		
Travel Within the SCCAB																		
Removal Haul Truck Travel [e]	0.001	0.007	0.013	0.000	0.001	0.001	0.000	3.575	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.465	0.000
Backfill Haul Truck Travel [e]	0.060	0.464	0.856	0.002	0.048	0.039	0.000	235.962	0.003	0.008	0.060	0.111	0.000	0.006	0.005	0.000	30.675	0.000
Worker Commute [f]	0.003	0.116	0.011	0.000	0.003	0.002	0.000	35.930	0.001	0.000	0.015	0.001	0.000	0.000	0.000	0.000	4.671	0.000
Total Offsite (Within the SCCAB)	**0.063**	**0.587**	**0.880**	**0.003**	**0.052**	**0.041**	**0.000**	**275.467**	**0.005**	**0.008**	**0.076**	**0.114**	**0.000**	**0.007**	**0.005**	**0.000**	**35.811**	**0.001**
Travel Within the SCAB																		
Removal Haul Truck Travel [e]	0.226	1.470	3.278	0.008	0.191	0.156	0.000	841.176	0.011	0.029	0.191	0.426	0.001	0.025	0.020	0.000	109.353	0.001
Backfill Haul Truck Travel [e]	0.043	0.278	0.619	0.002	0.036	0.029	0.000	158.849	0.002	0.006	0.036	0.080	0.000	0.005	0.004	0.000	20.650	0.000
Worker Commute [f]	0.024	1.182	0.109	0.004	0.035	0.017	0.000	374.522	0.013	0.003	0.154	0.014	0.000	0.005	0.002	0.000	48.688	0.002
Total Offsite (Within the SCAB)	**0.293**	**2.929**	**4.006**	**0.013**	**0.262**	**0.203**	**0.001**	**1,374.546**	**0.027**	**0.038**	**0.381**	**0.521**	**0.002**	**0.034**	**0.026**	**0.000**	**178.691**	**0.003**
Travel Within the MDAB																		
Removal Haul Truck Travel [e]	0.277	1.666	4.336	0.012	0.251	0.204	0.000	1,193.540	0.014	0.036	0.217	0.564	0.002	0.033	0.026	0.000	155.160	0.002
Travel Within the SJVAB																		
Removal Haul Truck Travel [e]	0.198	1.143	3.086	0.007	0.177	0.145	0.000	755.798	0.010	0.026	0.149	0.401	0.001	0.023	0.019	0.000	98.254	0.001
Travel Within the GBVAB																		
Removal Haul Truck Travel [e]	0.100	0.565	1.640	0.003	0.089	0.074	0.000	356.512	0.005	0.013	0.073	0.213	0.000	0.012	0.010	0.000	46.347	0.001
Travel Within Nevada																		
Removal Haul Truck Travel [e]	0.770	5.586	11.779	0.028	0.674	0.553	0.001	2,883.965	0.039	0.100	0.726	1.531	0.004	0.088	0.072	0.000	374.915	0.005
Travel Within Utah																		
Removal Haul Truck Travel [e]	0.105	0.760	1.602	0.004	0.092	0.075	0.000	392.277	0.005	0.014	0.099	0.208	0.000	0.012	0.010	0.000	50.996	0.001
Onsite Emissions for Year 2017 [c]																		
Crew Vans [d]	0.001	0.014	0.001	0.000	0.000	0.000	0.000	4.985	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.648	0.000

ATTACHMENT 1-5
Excavation Emissions (High Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Offsite Emissions for Year 2017 [c]																		
Travel Within the SCCAB																		
Removal Haul Truck Travel [e]	0.001	0.006	0.012	0.000	0.001	0.001	0.000	3.586	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.466	0.000
Backfill Haul Truck Travel [e]	0.054	0.423	0.760	0.002	0.045	0.036	0.000	236.683	0.003	0.007	0.055	0.099	0.000	0.006	0.005	0.000	30.769	0.000
Worker Commute [f]	0.002	0.104	0.010	0.000	0.003	0.002	0.000	35.864	0.001	0.000	0.014	0.001	0.000	0.000	0.000	0.000	4.662	0.000
Total Offsite (Within the SCCAB)	**0.057**	**0.534**	**0.781**	**0.003**	**0.048**	**0.038**	**0.000**	**276.133**	**0.004**	**0.007**	**0.069**	**0.102**	**0.000**	**0.006**	**0.005**	**0.000**	**35.897**	**0.001**
Travel Within the SCAB																		
Removal Haul Truck Travel [e]	0.202	1.355	2.879	0.008	0.175	0.141	0.000	842.332	0.010	0.026	0.176	0.374	0.001	0.023	0.018	0.000	109.503	0.001
Backfill Haul Truck Travel [e]	0.038	0.256	0.544	0.002	0.033	0.027	0.000	159.067	0.002	0.005	0.033	0.071	0.000	0.004	0.003	0.000	20.679	0.000
Worker Commute [f]	0.022	1.081	0.099	0.004	0.035	0.017	0.000	373.917	0.012	0.003	0.141	0.013	0.000	0.005	0.002	0.000	48.609	0.002
Total Offsite (Within the SCAB)	**0.262**	**2.692**	**3.522**	**0.013**	**0.243**	**0.185**	**0.001**	**1,375.316**	**0.024**	**0.034**	**0.350**	**0.458**	**0.002**	**0.032**	**0.024**	**0.000**	**178.791**	**0.003**
Travel Within the MDAB																		
Removal Haul Truck Travel [e]	0.248	1.576	3.792	0.012	0.230	0.184	0.000	1,193.414	0.012	0.032	0.205	0.493	0.002	0.030	0.024	0.000	155.144	0.002
Travel Within the SJVAB																		
Removal Haul Truck Travel [e]	0.177	1.069	2.686	0.007	0.160	0.130	0.000	755.761	0.009	0.023	0.139	0.349	0.001	0.021	0.017	0.000	98.249	0.001
Travel Within the GBVAB																		
Removal Haul Truck Travel [e]	0.089	0.519	1.418	0.003	0.081	0.066	0.000	356.497	0.004	0.012	0.067	0.184	0.000	0.011	0.009	0.000	46.345	0.001
Travel Within Nevada																		
Removal Haul Truck Travel [e]	0.690	5.092	10.254	0.028	0.611	0.497	0.001	2,883.661	0.035	0.090	0.662	1.333	0.004	0.079	0.065	0.000	374.876	0.005
Travel Within Utah																		
Removal Haul Truck Travel [e]	0.094	0.693	1.395	0.004	0.083	0.068	0.000	392.236	0.005	0.012	0.090	0.181	0.000	0.011	0.009	0.000	50.991	0.001

Notes:

[a] Daily Emissions (lbs/day) = Quantity of Vehicles x Daily VMT (miles/day) x Emission Factor (g/mile) / 453.6 (g/lb).

[b] Annual emissions were estimated assuming activities occur: 260 days per year

[c] Onsite emissions all occur within the SCCAB; offsite emissions were distributed amongst the air basins based on the haul routes for each vehicle, as presented in Attachment 1-9.

[d] Assumed crew members were transported around the site using one crew van; the emissions for Crew Vans were estimated using emission factors for 'Passenger Vehicles'.

[e] Emissions for Haul Trucks were estimated using emission factors for 'Heavy-Heavy Duty Trucks'. The daily and annual emissions will be multiplied by the quantity of vehicles in Attachment 1-2.

[f] Assumed workers live in Ventura County and Los Angeles County as listed below. It was also assumed workers commute in passenger vehicles.

Ventura County	50%
Los Angeles County	50%

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]								
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]	CO_2	CH_4
2016 Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.069	1.809	0.127	0.005	0.043	0.028	0.0001	566.303	0.026
Heavy-Heavy Duty Trucks [e]	1.659	7.099	8.730	0.024	0.427	0.356	0.001	2,545.962	0.079
2016 Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.022	0.999	0.095	0.003	0.028	0.014	0.0001	310.434	0.011
Heavy-Heavy Duty Trucks [e]	0.409	3.191	5.884	0.016	0.330	0.267	0.001	1,621.704	0.022
SCAB Emission Factors									
Passenger Vehicles [d]	0.020	0.979	0.090	0.003	0.029	0.014	0.0001	310.289	0.011
Heavy-Heavy Duty Trucks [e]	0.440	2.861	6.382	0.016	0.371	0.304	0.001	1,637.585	0.022
MDAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.382	2.300	5.985	0.016	0.347	0.281	0.001	1,647.565	0.019
SJVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.432	2.492	6.729	0.016	0.385	0.316	0.001	1,648.220	0.021

ATTACHMENT 1-5
Excavation Emissions (High Soil Removal Estimate)
NASA SSFL EIS: Air Quality

GBVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.462	2.613	7.589	0.016	0.414	0.343	0.001	1,650.140	0.022
Nevada Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.440	3.191	6.729	0.016	0.385	0.316	0.001	1,647.565	0.022
Utah Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.440	3.191	6.729	0.016	0.385	0.316	0.001	1,647.565	0.022
2017 Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.060	1.644	0.115	0.005	0.043	0.028	0.0001	565.310	0.024
Heavy-Heavy Duty Trucks [e]	1.497	6.269	7.940	0.024	0.375	0.308	0.001	2,552.056	0.071
2017 Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.019	0.902	0.085	0.003	0.028	0.014	0.0001	309.866	0.010
Heavy-Heavy Duty Trucks [e]	0.370	2.909	5.220	0.016	0.306	0.245	0.001	1,626.658	0.020
SCAB Emission Factors									
Passenger Vehicles [d]	0.018	0.896	0.082	0.003	0.029	0.014	0.0001	309.788	0.010
Heavy-Heavy Duty Trucks [e]	0.394	2.637	5.605	0.016	0.340	0.275	0.001	1,639.836	0.020
MDAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.343	2.175	5.235	0.016	0.317	0.254	0.001	1,647.391	0.017
SJVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.385	2.331	5.858	0.016	0.349	0.284	0.001	1,648.140	0.019
GBVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.410	2.402	6.563	0.016	0.374	0.306	0.001	1,650.070	0.020
Nevada Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.394	2.909	5.858	0.016	0.349	0.284	0.001	1,647.391	0.020
Utah Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.394	2.909	5.858	0.016	0.349	0.284	0.001	1,647.391	0.020

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007 for each air basin, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all air basins, all vehicle speeds, and all construction years: 0.0083 lbs/1,000 gallons

[d] Per Table 4-23 of the *National Transportation Statistics* (BTS, 2011), assumed a passenger fuel economy of: 33.7 miles per gallon

[e] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

[f] As a conservative estimate, the maximum California emission factors were assumed representative of Nevada and Utah.

ATTACHMENT 1-6

Road Repair Emissions (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

Construction Equipment Emissions

Construction Equipment	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Year 2016																		
Rubber Tired Dozers	2.789	11.665	22.361	0.023	0.913	0.913	0.001	2,646.299	0.251	0.031	0.128	0.246	0.000	0.010	0.010	0.000	29.109	0.003
Scrapers	2.729	10.092	22.162	0.028	0.848	0.848	0.001	3,211.340	0.243	0.030	0.111	0.244	0.000	0.009	0.009	0.000	35.325	0.003
Signal Boards	1.434	7.525	8.985	0.017	0.349	0.349	0.001	1,232.818	0.128	0.016	0.083	0.099	0.000	0.004	0.004	0.000	13.561	0.001
Excavators	0.971	6.641	6.556	0.012	0.353	0.353	0.000	1,121.188	0.087	0.011	0.073	0.072	0.000	0.004	0.004	0.000	12.333	0.001
Graders	1.213	7.303	8.616	0.013	0.475	0.475	0.001	1,238.080	0.109	0.013	0.080	0.095	0.000	0.005	0.005	0.000	13.619	0.001
Rubber Tired Loaders	0.772	4.059	4.823	0.006	0.386	0.386	0.000	588.595	0.069	0.008	0.045	0.053	0.000	0.004	0.004	0.000	6.475	0.001
Plate Compactors	0.050	0.263	0.314	0.001	0.012	0.012	0.000	43.099	0.004	0.001	0.003	0.003	0.000	0.000	0.000	0.000	0.474	0.000
Trenchers	1.078	4.558	6.647	0.007	0.550	0.550	0.000	648.357	0.097	0.012	0.050	0.073	0.000	0.006	0.006	0.000	7.132	0.001
Pavers	1.162	4.924	7.023	0.007	0.590	0.590	0.000	691.330	0.105	0.013	0.054	0.077	0.000	0.006	0.006	0.000	7.605	0.001
Paving Equipment	0.911	3.857	5.517	0.006	0.467	0.467	0.000	544.495	0.081	0.010	0.042	0.061	0.000	0.005	0.005	0.000	5.989	0.001
Rollers	0.794	3.967	5.107	0.006	0.415	0.415	0.000	589.347	0.072	0.009	0.044	0.056	0.000	0.005	0.005	0.000	6.483	0.001
Total Onsite (Within the SCCAB) [c]	**5.389**	**25.137**	**38.027**	**0.049**	**2.076**	**2.076**	**0.002**	**4,866.160**	**0.483**	**0.059**	**0.277**	**0.418**	**0.001**	**0.023**	**0.023**	**0.000**	**53.528**	**0.005**
Total Offsite (Within the SCCAB) [c]	**0.707**	**3.299**	**4.990**	**0.006**	**0.273**	**0.273**	**0.000**	**638.604**	**0.063**	**0.008**	**0.036**	**0.055**	**0.000**	**0.003**	**0.003**	**0.000**	**7.025**	**0.001**
Total Offsite (Within the SCAB) [c]	**7.808**	**36.418**	**55.094**	**0.071**	**3.008**	**3.008**	**0.003**	**7,050.184**	**0.700**	**0.086**	**0.401**	**0.606**	**0.001**	**0.033**	**0.033**	**0.000**	**77.552**	**0.008**
Year 2017																		
Rubber Tired Dozers	2.654	10.957	20.871	0.023	0.847	0.847	0.001	2,646.299	0.237	0.029	0.121	0.230	0.000	0.009	0.009	0.000	29.109	0.003
Scrapers	2.588	9.589	20.354	0.028	0.774	0.774	0.001	3,211.340	0.232	0.028	0.105	0.224	0.000	0.009	0.009	0.000	35.325	0.003
Signal Boards	1.434	7.525	8.985	0.017	0.349	0.349	0.001	1,232.818	0.128	0.016	0.083	0.099	0.000	0.004	0.004	0.000	13.561	0.001
Excavators	0.894	6.637	5.777	0.012	0.306	0.306	0.000	1,121.188	0.079	0.010	0.073	0.064	0.000	0.003	0.003	0.000	12.333	0.001
Graders	1.133	7.294	7.773	0.013	0.427	0.427	0.001	1,238.080	0.100	0.012	0.080	0.086	0.000	0.005	0.005	0.000	13.619	0.001
Rubber Tired Loaders	0.713	4.034	4.456	0.006	0.345	0.345	0.000	588.595	0.064	0.008	0.044	0.049	0.000	0.004	0.004	0.000	6.475	0.001
Plate Compactors	0.050	0.263	0.314	0.001	0.012	0.012	0.000	43.099	0.004	0.001	0.003	0.003	0.000	0.000	0.000	0.000	0.474	0.000
Trenchers	1.017	4.525	6.260	0.007	0.513	0.513	0.000	648.357	0.091	0.011	0.050	0.069	0.000	0.006	0.006	0.000	7.132	0.001
Pavers	1.094	4.889	6.599	0.007	0.547	0.547	0.000	691.330	0.099	0.012	0.054	0.073	0.000	0.006	0.006	0.000	7.605	0.001
Paving Equipment	0.857	3.831	5.182	0.006	0.433	0.433	0.000	544.495	0.077	0.009	0.042	0.057	0.000	0.005	0.005	0.000	5.989	0.001
Rollers	0.735	3.940	4.745	0.006	0.377	0.377	0.000	589.348	0.066	0.008	0.043	0.052	0.000	0.004	0.004	0.000	6.483	0.001
Total Onsite (Within the SCCAB) [c]	**5.104**	**24.605**	**35.393**	**0.049**	**1.912**	**1.912**	**0.002**	**4,866.160**	**0.457**	**0.056**	**0.271**	**0.389**	**0.001**	**0.021**	**0.021**	**0.000**	**53.528**	**0.005**
Total Offsite (Within the SCCAB) [c]	**0.670**	**3.229**	**4.645**	**0.006**	**0.251**	**0.251**	**0.000**	**638.604**	**0.060**	**0.007**	**0.036**	**0.051**	**0.000**	**0.003**	**0.003**	**0.000**	**7.025**	**0.001**
Total Offsite (Within the SCAB) [c]	**7.394**	**35.649**	**51.279**	**0.071**	**2.770**	**2.770**	**0.003**	**7,050.185**	**0.661**	**0.081**	**0.392**	**0.564**	**0.001**	**0.030**	**0.030**	**0.000**	**77.552**	**0.007**

Notes:

[a] Daily Emissions = Emission Factor (g/bhp-hr) x Equipment Quantity X Horsepower x Load Factor x Hours of Operation per Day / 453.6 (g/lb).

[b] Annual emissions will be scaled by the number of rebuilds occurring within each year. Annual emissions assume 1 road repair lasts 1 month or: 22 days

[c] Since the roads to be repaired are located both in Ventura and Los Angeles counties and both on- and offsite, assumed activities occur within Ventura County (SCCAB; on- and offsite) and Los Angeles County (SCAB) as follows:

Onsite SCCAB	39%
Offsite SCCAB	5%
Offsite SCAB	56%

ATTACHMENT 1-6

Road Repair Emissions (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

Construction Equipment Emission Factors

Construction Equipment	Emission Factors (g/bhp-hr) [a]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb [b, c]	CO_2	CH_4
Year 2016									
Rubber Tired Dozers	0.599	2.505	4.802	0.005	0.196	0.196	0.0002	568.299	0.054
Scrapers	0.483	1.786	3.922	0.005	0.15	0.15	0.0002	568.299	0.043
Signal Boards	0.661	3.469	4.142	0.008	0.161	0.161	0.0002	568.299	0.059
Excavators	0.492	3.366	3.323	0.006	0.179	0.179	0.0002	568.299	0.044
Graders	0.557	3.352	3.955	0.006	0.218	0.218	0.0002	568.299	0.05
Rubber Tired Loaders	0.745	3.919	4.657	0.006	0.373	0.373	0.0002	568.299	0.067
Plate Compactors	0.661	3.469	4.142	0.008	0.161	0.161	0.0002	568.299	0.059
Trenchers	0.945	3.995	5.826	0.006	0.482	0.482	0.0002	568.299	0.085
Pavers	0.955	4.048	5.773	0.006	0.485	0.485	0.0002	568.299	0.086
Paving Equipment	0.951	4.026	5.758	0.006	0.487	0.487	0.0002	568.299	0.085
Rollers	0.766	3.825	4.925	0.006	0.4	0.4	0.0002	568.299	0.069
Year 2017									
Rubber Tired Dozers	0.57	2.353	4.482	0.005	0.182	0.182	0.0002	568.299	0.051
Scrapers	0.458	1.697	3.602	0.005	0.137	0.137	0.0002	568.299	0.041
Signal Boards	0.661	3.469	4.142	0.008	0.161	0.161	0.0002	568.299	0.059
Excavators	0.453	3.364	2.928	0.006	0.155	0.155	0.0002	568.299	0.04
Graders	0.52	3.348	3.568	0.006	0.196	0.196	0.0002	568.299	0.046
Rubber Tired Loaders	0.688	3.895	4.302	0.006	0.333	0.333	0.0002	568.299	0.062
Plate Compactors	0.661	3.469	4.142	0.008	0.161	0.161	0.0002	568.299	0.059
Trenchers	0.891	3.966	5.487	0.006	0.45	0.45	0.0002	568.299	0.08
Pavers	0.899	4.019	5.425	0.006	0.45	0.45	0.0002	568.299	0.081
Paving Equipment	0.894	3.998	5.409	0.006	0.452	0.452	0.0002	568.299	0.08
Rollers	0.709	3.799	4.576	0.006	0.364	0.364	0.0002	568.3	0.064

Notes:

[a] Emission factors were obtained from Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[b] A lead emission factor for stationary and portable internal combustion engines was assumed representative of construction equipment. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010): 0.0083 lbs/1,000 gallons

[c] For construction equipment, assumed the following diesel fuel consumption per Table A9-8-C of the *CEQA Handbook* (1993): 0.066 gallons/bhp-hr

Fugitive Dust Emissions From Disturbed Surfaces

Pollutant	Emissions (lbs/day) [a, b]	Emissions (tons/year) [c]
Year 2016		
PM_{10} Emissions	32.000	0.352
$PM_{2.5}$ Emissions [d]	6.656	0.073
Total Onsite Within the SCCAB [e]		
PM_{10} Total Emissions	**12.403**	**0.136**
$PM_{2.5}$ Total Emissions	**2.580**	**0.028**
Total Offsite Within the SCCAB [e]		
PM_{10} Total Emissions	**1.628**	**0.018**
$PM_{2.5}$ Total Emissions	**0.339**	**0.004**
Total Offsite Within the SCAB [e]		
PM_{10} Total Emissions	**17.969**	**0.198**
$PM_{2.5}$ Total Emissions	**3.738**	**0.041**

ATTACHMENT 1-6
Road Repair Emissions (High and Low Soil Removal Estimates)
NASA SSFL EIS: Air Quality

Year 2017		
PM_{10} Emissions	32.000	0.352
$PM_{2.5}$ Emissions [d]	6.656	0.073
Total Onsite Within the SCCAB [e]		
PM_{10} Total Emissions	**12.403**	**0.136**
$PM_{2.5}$ Total Emissions	**2.580**	**0.028**
Total Offsite Within the SCCAB [e]		
PM_{10} Total Emissions	**1.628**	**0.018**
$PM_{2.5}$ Total Emissions	**0.339**	**0.004**
Total Offsite Within the SCAB [e]		
PM_{10} Total Emissions	**17.969**	**0.198**
$PM_{2.5}$ Total Emissions	**3.738**	**0.041**

Notes:

[a] Daily PM_{10} Emissions (lbs/day) = Maximum Area Disturbed per Day (acres) x Emission Factor (lbs/day/acre).

[b] The PM_{10} Emission Factor was taken from Table A-4 of Appendix A of the *URBEMIS User's Guide* : 20 lbs/acre/day

[c] Annual emissions were estimated by scaling the daily emissions by the number of days each rebuild lasts and the number of rebuilds occurring per year, as documented in Attachment 1-10. Each month was assumed to have: 22 days

[d] Per Appendix A of the *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006), $PM_{2.5}$ emissions from construction activities were assumed to be: 20.8% of the PM_{10} emissions

[e] Since the roads to be repaired are located both in Ventura and Los Angeles counties and both on- and offsite, assumed activities occur within Ventura County (SCCAB; on- and offsite) and Los Angeles County (SCAB) as follows:

Onsite SCCAB	39%
Offsite SCCAB	5%
Offsite SCAB	56%

Vehicle Emissions

Vehicle Type	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Onsite Emissions for Year 2016 [c]																		
Crew Vans [d]	0.001	0.032	0.002	0.000	0.001	0.000	0.000	9.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.000
Offsite Emissions for Year 2016 [c]																		
Travel Within the SCCAB																		
Worker Commute [e]	0.004	0.172	0.016	0.001	0.005	0.002	0.000	53.382	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.587	0.000
Travel Within the SCAB																		
Worker Commute [e]	0.049	2.422	0.223	0.007	0.072	0.035	0.000	767.514	0.027	0.001	0.027	0.002	0.000	0.001	0.000	0.000	8.443	0.000
Onsite Emissions for Year 2017 [c]																		
Crew Vans [d]	0.001	0.029	0.002	0.000	0.001	0.000	0.000	9.970	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.000
Offsite Emissions for Year 2017 [c]																		
Travel Within the SCCAB																		
Worker Commute [e]	0.003	0.155	0.015	0.001	0.005	0.002	0.000	53.284	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.586	0.000

ATTACHMENT 1-6

Road Repair Emissions (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

Travel Within the SCAB																		
Worker Commute [e]	0.045	2.216	0.203	0.007	0.072	0.035	0.000	766.275	0.025	0.000	0.024	0.002	0.000	0.001	0.000	0.000	8.429	0.000

Notes:

[a] Daily Emissions (lbs/day) = Quantity of Vehicles x Daily VMT (miles/day) x Emission Factor (g/mile) / 453.6 (g/lb).

[b] Annual emissions will be scaled by the number of rebuilds occurring within each year. Annual emissions assume 1 road repair lasts 1 month or: 22 days

[c] Onsite emissions all occur within the SCCAB; offsite emissions were distributed amongst the air basins based on the commute routes, as presented in Attachment 1-10.

[d] Assumed crew members were transported around the site using two crew vans; the emissions for Crew Vans were estimated using emission factors for 'Passenger Vehicles'.

[e] Assumed workers live in Ventura County and Los Angeles County as listed below. It was also assumed workers commute in passenger vehicles.

Ventura County	50%
Los Angeles County	50%

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]								
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]	CO_2	CH_4
2016 Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.069	1.809	0.127	0.005	0.043	0.028	0.0001	566.303	0.026
2016 Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.022	0.999	0.095	0.003	0.028	0.014	0.0001	310.434	0.011
SCAB Emission Factors									
Passenger Vehicles [d]	0.020	0.979	0.090	0.003	0.029	0.014	0.0001	310.289	0.011
2017 Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.060	1.644	0.115	0.005	0.043	0.028	0.0001	565.310	0.024
2017 Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.019	0.902	0.085	0.003	0.028	0.014	0.0001	309.866	0.010
SCAB Emission Factors									
Passenger Vehicles [d]	0.018	0.896	0.082	0.003	0.029	0.014	0.0001	309.788	0.010

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007 for each air basin, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all air basins, all vehicle speeds, and all construction years: 0.0083 lbs/1,000 gallons

[d] Per Table 4-23 of the *National Transportation Statistics* (BTS, 2011), assumed a passenger fuel economy of: 33.7 miles per gallon

ATTACHMENT 1-7
Demolition Data (High and Low Soil Removal Estimates)
NASA SSFL EIS: Air Quality

Demolition Schedule

Start Date (Month and Year) [a]	January 2014
Project Duration (Months) [b]	12
Work Days per Week [c]	5
Work Hours per Day [d]	10
Work Days per Year [b]	150
Total Mass Demolished (tons) [e]	94,536
Total Mass Demolished per Day (tons/day)	630
Total Volume Demolished (ft^3) [f]	1,316,801
Volume Demolished per Day (ft^3/day)	8,779

Notes:

[a] The DOPAA indicates that demolition activities will occur between 2014 and 2016. For this analysis, conservatively assumed activities begin January 2014. Per K. Criswell/NASA, demolition may actually occur on and off for up to two years as NASA is approved for funding for fiscal years 2014 and 2015 (Fwd: SSFL EIS - Demolition Truth-checking (UNCLASSIFIED).msg).

[b] Conservatively assumed activities last up to 12 months although data provided by K. Criswell/NASA, shown in the 'Demolition Equipment Estimates' table, was intended for an 8 month period (or 150 days).

[c] Assume demolition activities occur 5 days per week.

[d] To allow for heightened activity, assume demolition activities occur up to 10 hours per day within the SSFL operational hours of 7 am to 7 pm. Per R. Dean/CH2M HILL, this is consistent with the Boeing ISRA activities (RE: SSFL EIS - AQ Calculations Table.msg).

[e] Total Mass Demolished taken from 'Demolition Equipment Estimates' table or Appendix 2 of the *Site Visit Report and Demolition Budget Cost Estimate* (Frankie Friend & Associates, Inc., 2011). Mass per material category is as follows:

Concrete	43,152	tons
Scrap Metal	8,250	tons
Salvaged Equipment	8,134	tons
Asphalt	35,000	tons

[f] To convert Total Mass Demolished to a Total Volume Demolished, conservatively used the density for concrete (kg/m^3): 2,300

Demolition Equipment Estimates [a, b, c]

Description	Quantity	Vehicle Trips	Estimated Total Round Trips (To/From Site)	Onsite Round Trip Distance (miles) [d, e]	Offsite Round Trip Distance (miles)	Comments	Air Quality Assumptions / Questions
On-road Equipment Requirements							
Crew Van	2	150	300	4	0	15 Passenger Van	Vehicles never leave the site; Section 2 of the SSFL EIS indicates 30 crew workers onsite each day. Assumed 2 crew vehicles would be necessary to transport all 30 workers and that each van would make one trip to/from the site each day of demolition activity (150 days).
Supervisory Vehicles	4	150	600	4	0	Cars or Pickup Trucks	Vehicles never leave the site; assume 4 supervisors onsite each day.
Tractor-trailer End Dump Truck (25 ton)	6	55	330	4	72	Used for scrap metal transport.	Estimates indicate that 8,250 tons of scrap metal will be transported. Scrap metal is likely to be hauled to San Pedro for export (approximately 72 miles roundtrip).
Standard Tractor-trailer Flatbed	2	10	20	4	50	Used for transport of useable salvaged equipment such as A/C units and electrical equipment.	Useable salvaged equipment is likely to be hauled to an equipment dealer within 25 miles of the site.
Tractor-trailer End Dump Truck (25 ton) [f]	5	345	1,726	0	335	Used for transporting concrete.	Conservatively assume that all concrete is hazardous and is transported offsite to Kettleman Hills (167.5 miles north of site).

ATTACHMENT 1-7
Demolition Data (High and Low Soil Removal Estimates)
NASA SSFL EIS: Air Quality

Tractor-trailer End Dump Truck (25 ton)	8	175	1,400	4	24	Used for hauling asphalt paving to a recycle firm in the area over a total of 100 work days (approximately 14 loads per day).	Assumed that asphalt is transported to P.W. Gillibrand Co., Inc., which is 12 miles from the site. Estimates indicate that 35,000 tons of asphalt will be transported.
Description	**Quantity**	**Vehicle Trips**	**Estimated Total Round Trips (To/From Site)**	**Horsepower [g]**	**Load Factor [g]**	**Comments**	**Air Quality Assumptions / Questions**
Off-road Equipment Requirements							
Excavators (one 75 ton; two 50 ton; and two 25 ton)	5	8	20	157	0.57	Includes attachments and counterweights, if needed.	Emissions based on 10 hours per day of operation. Conservatively assume all equipment operates at the same time. Emissions from Miscellaneous Small Equipment will be represented using a pump emission factor.
Crawler Crane (100 ton)	1	8	8	208	0.43	Includes boom and counterweights.	
All-terrain Crane (50 ton)	2	4	8	208	0.43		
Manlifts (60 ft or 80 ft)	2	6	12	34	0.46		
Wheel Loaders (5 cy)	2	4	8	87	0.54		
Off-highway Trucks (40 ton)	2	4	8	381	0.57		
Doser (D-6 size)	1	4	4	358	0.59		
Vacuum Truck	1	4	4	381	0.57		
Motor Grader	1	6	6	162	0.61		
Skid-steer Loaders	4	2	8	37	0.55		
Miscellaneous Small Equipment	12	2	24	84	0.74	Includes compressors, pumps, lighting plants, dust control equipment, etc.	

Notes:

[a] Equipment estimates provided are for 100% Demolition.

[b] Unless otherwise noted, data provided by K. Criswell/NASA (RE: SSFL Demolition Alternative Data Needs.msg and SSFL Demo Proj - Estimated Truck Equip Rqmt.pdf).

[c] Except for the Tractor-trailer End Dump Truck vehicle trips, values presented are based on an estimated project duration of 150 working days.

[d] Except for the crushed concrete transport, the round trip distance between the site location and entrance gate was estimated to be 1.5 to 4 miles using Google Earth™. As a conservative estimate, a distance of 4 miles will be used for onsite travel.

[e] It was assumed that the crushed concrete would be transported a negligible distance as the laydown areas are expected to be near the site locations, as provided by K. Criswell/NASA (RE: SSFL Demolition Alternative Data Needs.msg).

[f] For the concrete transport, the total number of round trips and the number of trips per truck were estimated based on the truck capacity (25 tons) and the amount of concrete to be crushed (43,152 tons), as provided by K. Criswell/NASA (RE: SSFL Demolition Alternative Data Needs.msg).

[g] Horsepower and load factors taken as the average for each equipment type from Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

Crew Member Estimates for Demolition

Round Trip Distance Traveled to Site (miles) [a, b]	40
Round Trip Distance Traveled Onsite (miles) [a, c]	4
Number of Crew Members [d, e]	34

Notes:

[a] Assumed that crew members travel to the site using personal vehicles and are transported around the site using 15-passenger vans.

[b] The round trip distance crew members may travel to the site was estimated at 40 miles due to the isolated site and surrounding city locations.

[c] The round trip distance crew members may travel onsite was taken from the 'Demolition Equipment Estimates' table.

[d] Assumed 34 crew members onsite for demolition (30 workers per Section 2 of the SSFL EIS and 4 supervisors) based on the vehicles described in the 'Demolition Equipment Estimates' table.

[e] Crew member estimates provided are for 100% Demolition.

ATTACHMENT 1-7
Demolition Data (High and Low Soil Removal Estimates)
NASA SSFL EIS: Air Quality

Haul Route to San Pedro

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	71	99%	SCAB
Ventura	1	1%	SCCAB
Total	**72**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) to San Pedro (where the port for export is located) is 72 miles. The distance traveled within Los Angeles County was back-calculated from the known total distance and the known distance from the site to the Ventura County border.

Haul Route to Los Angeles County Equipment Dealer

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	49	98%	SCAB
Ventura	1	2%	SCCAB
Total	**50**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) to the equipment dealer is 50 miles. It was assumed that the dealer is located in Los Angeles County. As such, all travel takes place in Los Angeles County once the truck crosses the Los Angeles County border, located approximately 1 mile from the facility entrance.

Haul Route to Kettleman Hills

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Kings	38	11%	SJVAB
Kern	170	51%	SJVAB
Los Angeles	126	38%	SCAB
Ventura	1	0%	SCCAB
Total	**335**	**100%**	

Notes:

[a] The roundtrip distance (miles) within each air basin was estimated using Google Earth.

Haul Route to Simi Valley

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	18	75%	SCAB
Ventura	6	25%	SCCAB
Total	**24**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) to Simi Valley (where asphalt is transported) is 24 miles. The distance traveled within Los Angeles and Ventura counties was estimated assuming trucks travel within Los Angeles County to reach Highway 118.

ATTACHMENT 1-7
Demolition Data (High and Low Soil Removal Estimates)
NASA SSFL EIS: Air Quality

Worker Commute from Los Angeles County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	39	98%	SCAB
Ventura	1	3%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. If employees live in Los Angeles County, all travel takes place in Los Angeles County once the employee crosses the Los Angeles County border, located approximately 1 mile from the facility entrance.

Worker Commute from Ventura County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	34	85%	SCAB
Ventura	6	15%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. The distance traveled within Los Angeles and Ventura counties was estimated assuming employees travel within Los Angeles County to reach Highway 118 and travel a bit beyond the location for asphalt disposal.

ATTACHMENT 1-8

Excavation Data (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Activity Durations for Annual Scaling [a]

Excavation Duration (Days) [b]	
Construction Year 2016	238
Construction Year 2017	260
Material Hauling / Stockpile Duration (Days) [c]	
Construction Year 2016	238
Construction Year 2017	260

Notes:

[a] The durations presented were used to scale annual emissions based on a full 260 day schedule to match the actual project schedule.

[b] For excavation, the 2016 duration accounts for activities beginning in February 2016 per the schedule provided. Excavation activities would also occur in 2017 if the required duration was longer than the 11 months of 2016.

[c] For material hauling, the 2016 duration accounts for activities beginning in February 2016 per the schedule provided. It was assumed that material hauling would take the entire allowable duration. Stockpiling would be necessary from the start of excavation (simultaneous with material hauling) to the completion of material hauling.

Excavation Schedule for the High Soil Removal Estimate [a]

Excavation Start Date (Month and Year) [b]	February 2016
Excavation Duration (Months)	23
Excavation Duration (Days)	498
Work Days per Week [c]	5
Work Hours per Day [d]	10

Notes:

[a] Per Section 1.2.2 of the SSFL EIS, the NASA-administered area over which excavation activities occur is: 421.2 acres

[b] The SSFL EIS indicates that excavation activities for the High Soil Removal Estimate will occur from February 2016 to December 2017. Assume material hauling begins at the same time. Hauling duration is presented in 'Soil Hauling Truck Estimates' table.

[c] Assume excavation and hauling activities occur 5 days per week.

[d] To allow for heightened activity, assume excavation activities occur up to 10 hours per day within the SSFL operational hours of 7 a.m. to 7 p.m. Per R. Dean/CH2M HILL, this is consistent with the Boeing ISRA activities (RE: SSFL EIS - AQ Calculations Table.msg).

Soil Hauling Truck Estimates for the High Soil Removal Estimate

Truck Capacity (cy/truck) [a]	19

ATTACHMENT 1-8

Excavation Data (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Removal Volume (cy) [b]	502,381
Removal Trucks	26,441
Removal Frequency (trucks/day) [c]	53
Backfill Volume (cy) [d]	167,460
Backfill Trucks	8,814
Backfill Frequency (trucks/day) [c]	18
Hauling Duration (days)	498
Daily Material Handled (tons/day) [e]	1,698

Notes:

[a] According to C. Brady/Kettleman Hills Landfill (559-318-6086), a realistic average load for light-weight truck and trailer combinations is 19 cy (approximately 24 tons).

[b] Removal volumes (cy) provided by O. Edwards/CH2M HILL (CY summary for ea scenario.pdf).

[c] The frequency of trucks was back-calculated from the maximum duration (hauling must be completed by 2017) and the total trucks necessary to off-haul the soil or bring in clean backfill.

[d] According to L. Tice/CH2M HILL and J. Glasgow/CH2M HILL (RE: SSFL EIS - AQ Calculations Table(2).msg), up to 1/3rd of the soil excavated will be replaced using clean backfill taken from onsite areas adjacent to the excavation areas. Since the clean backfill will be from an onsite source, additional offsite truck hauling will not be required. Additionally, the backfilling activities will be performed using the excavation equipment during downtime. Assume stockpiling of the backfill is not required.

[e] Estimated the Daily Material Handled by considering the total removal and backfill volumes, a soil density of 24 tons per 19 cy (per note a above), and the number of active days in 2016 through 2017 (during which stockpiles may be formed or trucks may be loaded).

ATTACHMENT 1-8

Excavation Data (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Excavation Equipment Estimates for the High Soil Removal Estimate

Equipment Type [a]	Quantity [a]	Daily Hours of Operation [b]	Horsepower [c]	Load Factor [c]
Rubber Tired Dozers	1	10	358	0.59
Concrete/Industrial Saws	1	10	81	0.73
Tractors/Loaders/Backhoes	3	10	75	0.55
Graders	1	10	162	0.61
Excavators	2	10	157	0.57
Scrapers	2	10	356	0.72

Notes:

[a] The equipment list and quantity of each equipment type were taken as the maximum possible equipment counts for grading from Table 3.2 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[b] Assumed each equipment would operate 10 hours per day, consistent with the schedule provided in the 'Excavation Schedule' table.

[c] Horsepower and load factors taken as the average for each equipment type from Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

Stockpile Estimates for the High Soil Removal Estimate

Stockpiles Utilized (Y or N) [a]	Yes
Number of Stockpiles [b]	377
Maximum Size of Stockpiles (acres) [c]	0.14

Notes:

[a] As a conservative estimate, assumed that the stockpiles would be used from the start of excavation/hauling activities to the end of hauling activities, which coincides with the total hauling duration.

[b] Number of Stockpiles was estimated based on the total soil removal and backfill volumes, the Maximum Size of Stockpiles, and the conservative assumption that, per SCAQMD Rule 1157(d)(6)(C), each stockpile has a maximum height of: 8 feet

[c] Based on VCAPCD Rule 74.29, Maximum Size of Stockpiles conservatively assumed to be: 6,000 square feet

ATTACHMENT 1-8

Excavation Data (High Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Crew Member Estimates for the High Soil Removal Estimate

Round Trip Distance Traveled to Site (miles) [a, b]	40
Round Trip Distance Traveled Onsite (miles) [a, c]	4
Number of Crew Members [d]	15

Notes:

[a] Assumed that crew members travel to the site using personal vehicles and are transported around the site using 15-passenger vans.

[b] The round trip distance crew members may travel to the site was estimated at 40 miles due to the isolated site and surrounding city locations.

[c] The round trip distance crew members may travel onsite was assumed to be the same distance as that for demolition activities (see Attachment 1-7).

[d] Assumed 15 crew members to allow for at least one crew member per excavation equipment and a few extras.

Worker Commute from Los Angeles County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	39	98%	SCAB
Ventura	1	3%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. If employees live in Los Angeles County, all travel takes place in Los Angeles County once the employee crosses the Los Angeles County border, located approximately 1 mile from the facility entrance.

Worker Commute from Ventura County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	34	85%	SCAB
Ventura	6	15%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. The distance traveled within Los Angeles and Ventura counties was estimated assuming employees travel within Los Angeles County to reach Highway 118 and travel a bit beyond the location for asphalt disposal, as described in Attachment 1-7.

ATTACHMENT 1-9

Haul Routes Considered (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

Haul Routes to Possible Landfills for Soil Removal

State or California Air Basin		SCCAB	SCAB		MDAB	SJVAB		GBVAB	Nevada					Utah
Landfill	Total Roundtrip Distance (miles)	Roundtrip Distance per County (miles) [a]												
		Ventura	Los Angeles	San Bernardino		Kern	Kings	Inyo	Nye	Clark	Lincoln	White Pine	Elko	Tooele
Kettleman Hills	335	1	126			170	38							
Buttonwillow	252	1	126			125								
U.S. Ecology	679	1	144.2	88.8	277.8			98	69.4					
Antelope Valley	141	1	140											
Energy Solutions	1,465	1	144.2	88.8	328.6				78	178	200	226	112	108
Maximum Distance per County (miles)		**1**	**144.2**	**88.8**	**328.6**	**170**	**38**	**98**	**78**	**178**	**200**	**226**	**112**	**108**
Maximum Distance per California Air Basin or State (miles)		**1**	**233**		**328.6**	**208**		**98**	**794**					**108**

Notes:

Shaded cells indicate counties that have attainment for all pollutants considered.

[a] The roundtrip distance (miles) within each air basin was estimated using Google Earth.

Haul Routes from Possible Aggregate Suppliers for Clean Backfill

State or California Air Basin		SCCAB	SCAB
Aggregate Supplier	Total Roundtrip Distance (miles)	Roundtrip Distance per County (miles) [a]	
		Ventura	Los Angeles
P.W. Gillibrand Co.	45	21.4	23.4
Rindge Dam	45	1.0	44.0
Santa Paula Materials	89	66.0	23.4
Grimes Rock	66	42.8	23.4
Tapo Rock and Sand Products	43	19.4	23.4
Maximum Distance per County (miles)		**66**	**44**
Maximum Distance per California Air Basin (miles)		**66**	**44**

Notes:

[a] The roundtrip distance (miles) within each air basin was estimated using Google Earth.

ATTACHMENT 1-10

Road Repair Data (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

General Comments:

1) Road repairs may be used as a mitigation measure per the text shown below:

> Some local roadways used by heavy vehicles to access and egress the project site are not designated freight routes by the city or county of Los Angeles. As such, there is increased potential for roadway damage to occur on these facilities over the course of project construction. In anticipation of this roadway damage, the project team will coordinate with the City and County Road Maintenance Departments to restore and repair roadway damage that creates an unsafe or hazardous roadway condition on an as-needed basis. Additionally, the project team will conduct annual maintenance and preventive repair on non-freight designated local roadways. Annual maintenance will include repairing potholes, applying sealant, resurfacing, restructuring, and restriping where necessary. At completion of the project, non-freight roadways will be repaired to their pre-construction condition.

Road Repair Schedule for Excavation and Offsite Disposal

Frequency of Rebuilds (per year) [a, b]	1
Rebuild Duration (months) [a, b]	1
Maximum Area Disturbed per Day (acres) [b]	1.6
Work Days per Week [c]	5
Work Hours per Day [d]	10
Years Repair Necessary [e]	2016 - 2017
Description of Repairs (e.g., patching, rebuild) [a]	Patching, overlay, resurface, reconstruction

Notes:

[a] Data provided by G. Satterwhite/CH2M HILL (Air Quality Data_111811_NoGC_GS.xlsx and FW AQ Calculations.msg).

[b] Data provided by R. Diven/NASA (RJ Diven Review_Air Quality Data_111811_NoGC.xlsx and Fwd: SSFL EIS - Demolition Truth-checking (UNCLASSIFIED).msg). If the same data were provided by G. Satterwhite/CH2M HILL (per note a), the more conservative value was used for this analysis.

[c] Assume road repair activities occur 5 days per week.

[d] To allow for heightened activity, assume excavation activities occur up to 10 hours per day within the SSFL operational hours of 7 a.m. to 7 p.m. Per R. Dean/CH2M HILL, this is consistent with the Boeing ISRA activities (RE: SSFL EIS - AQ Calculations Table.msg).

[e] Years Repair Necessary correspond to the duration during which material hauling will occur. If material hauling is not occurring, road repair should not be required.

ATTACHMENT 1-10

Road Repair Data (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

Road Details

Road	Woolsey Canyon Road	Roscoe Boulevard	Valley Circle Boulevard	Onsite Roads [a]
Length (miles) [b]	2.55	2.33	1.14	3.81
Width (miles) [c]	0.0045	0.0045	0.0045	0.0045
Area (acres)	7.42	6.78	3.32	11.08
Type of Road	Sand Gravel	Sand Gravel	Sand Gravel	Sand Gravel

Notes:

[a] Onsite roads include the roads used solely by NASA as mixed-use roads are repaired by Boeing.

[b] Road lengths provided by S. Stevens/NASA (RE: onsite road repair.msg) and A. Cooley/NASA (RE: onsite road repair(3).msg).

[c] Road width estimated assuming 12 feet per lane.

Road Repair Equipment Estimates for Excavation and Offsite Disposal

Equipment Type [a]	Quantity [a]	Daily Hours of Operation [b]	Horsepower [c]	Load Factor [c]
Rubber Tired Dozers	1	10	358	0.59
Scrapers	1	10	356	0.72
Signal Boards	20	10	6	0.82
Excavators	1	10	157	0.57
Graders	1	10	162	0.61
Rubber Tired Loaders	1	10	87	0.54
Plate Compactors	1	10	8	0.43
Trenchers	1	10	69	0.75
Pavers	1	10	89	0.62
Paving Equipment	1	10	82	0.53
Rollers	1	10	84	0.56

Notes:

[a] The equipment list was determined based on the Sacramento Roadway Model, using the parameters detailed in the previous tables.

[b] Assumed each equipment would operate 10 hours per day, consistent with the schedule provided in the 'Road Repair Schedule' table.

[c] Horsepower and load factors taken as the average for each equipment type from Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011) to be consistent with the Excavation and Demolition equipment estimates.

ATTACHMENT 1-10

Road Repair Data (High and Low Soil Removal Estimates)

NASA SSFL EIS: Air Quality

Crew Member Estimates for Excavation and Offsite Disposal

Round Trip Distance Traveled to Site (miles) [a, b]	40
Round Trip Distance Traveled Onsite (miles) [a, c]	4
Number of Crew Members [d]	30

Notes:

[a] Assumed that crew members travel to the site using personal vehicles and are transported around the site using 15-passenger vans.

[b] The round trip distance crew members may travel to the site was estimated at 40 miles due to the isolated site and surrounding city locations.

[c] The round trip distance crew members may travel onsite was assumed to be the same distance as that for demolition activities (see Attachment 1-7).

[d] The number of crew members was determined based on the Sacramento Roadway Construction Model, using the parameters detailed in the above tables.

Worker Commute from Los Angeles County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	40	100%	SCAB
Ventura	0	0%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. If employees live in Los Angeles County, all travel takes place in Los Angeles County, assuming employees park their personal vehicles in Los Angeles County.

Worker Commute from Ventura County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	35	87%	SCAB
Ventura	5	13%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. The distance traveled within Los Angeles and Ventura counties was estimated assuming employees travel within Los Angeles County to reach Highway 118 and travel a bit beyond the location for asphalt disposal, as described in Attachment 1-7. Assumed employees park their personal vehicles in Los Angeles County, slightly reducing the distance traveled within the SCCAB.

ATTACHMENT 2-1

General Conformity Estimates for Demolition, Excavation, and Offsite Disposal (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

General Conformity Estimates for Demolition, Excavation, and Offsite Disposal

Pollutant	Pollutant Thresholds (tons/year)	Low Soil Removal Annual Emissions (tons/year)			High Soil Removal Annual Emissions (tons/year)			Percent Reductions Relative to High Soil Removal		
		2014	2016	2017	2014	2016	2017	2014	2016	2017
South Central Coast Air Basin (SCCAB)										
VOC	50	3	2	2	3	2	2	0%	-3%	-3%
CO	N/A	12	9	10	12	9	10	0%	-4%	-4%
NOx	50	20	14	14	20	15	15	0%	-5%	-4%
SO_2	N/A	0	0	0	0	0	0	0%	-8%	-8%
PM_{10}	N/A	2	851	929	2	1,050	1,146	0%	-19%	-19%
$PM_{2.5}$	N/A	1	178	194	1	219	239	0%	-19%	-19%
Pb	N/A	0	0	0	0	0	0	0%	-32%	-32%
South Coast Air Basin (SCAB) [a]										
VOC	10	0	1	1	0	2	2	0%	-34%	-34%
CO	100	1	7	7	1	10	10	0%	-34%	-34%
NOx	10	2	15	14	2	23	22	0%	-35%	-35%
SO_2	100	0	0	0	0	0	0	0%	-35%	-36%
PM_{10}	70	0	1	1	0	2	2	0%	-31%	-31%
$PM_{2.5}$	100	0	1	1	0	1	1	0%	-34%	-34%
Pb	25	0	0	0	0	0	0	0%	-35%	-35%
San Joaquin Valley Air Basin (SJVAB) [a]										
VOC	10	0	1	1	0	1	1	0%	-36%	-36%
CO	N/A	0	5	5	0	7	7	0%	-36%	-36%
NOx	10	2	12	12	2	20	19	0%	-36%	-36%
SO_2	100	0	0	0	0	0	0	0%	-36%	-36%
PM_{10}	70	0	1	1	0	1	1	0%	-36%	-36%
$PM_{2.5}$	100	0	1	1	0	1	1	0%	-36%	-36%
Pb	N/A	0	0	0	0	0	0	0%	-36%	-36%
Mojave Desert Air Basin (MDAB)										
VOC	100	N/A	1	1	N/A	2	2	N/A	-36%	-36%
CO	N/A	N/A	7	7	N/A	11	11	N/A	-36%	-36%
NOx	100	N/A	17	17	N/A	27	26	N/A	-36%	-36%
SO_2	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
PM_{10}	100	N/A	1	1	N/A	2	2	N/A	-36%	-36%
$PM_{2.5}$	N/A	N/A	1	1	N/A	1	1	N/A	-36%	-36%
Pb	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
Great Basin Valley Air Basin (GBVAB) [b]										
VOC	N/A	N/A	0	0	N/A	1	1	N/A	-36%	-36%
CO	N/A	N/A	2	2	N/A	4	4	N/A	-36%	-36%
NOx	N/A	N/A	7	6	N/A	10	10	N/A	-36%	-36%
SO_2	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
PM_{10}	N/A	N/A	0	0	N/A	1	1	N/A	-36%	-36%
$PM_{2.5}$	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
Pb	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
Nevada [a]										
VOC	100	N/A	3	3	N/A	5	5	N/A	-36%	-36%
CO	100	N/A	22	22	N/A	35	35	N/A	-36%	-36%
NOx	100	N/A	47	45	N/A	74	71	N/A	-36%	-36%
SO_2	100	N/A	0	0	N/A	0	0	N/A	-36%	-36%
PM_{10}	70	N/A	3	3	N/A	4	4	N/A	-36%	-36%
$PM_{2.5}$	N/A	N/A	2	2	N/A	3	3	N/A	-36%	-36%
Pb	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
Utah										
VOC	N/A	N/A	0	0	N/A	1	1	N/A	-36%	-36%
CO	N/A	N/A	3	3	N/A	5	5	N/A	-36%	-36%
NOx	N/A	N/A	6	6	N/A	10	10	N/A	-36%	-36%
SO_2	100	N/A	0	0	N/A	0	0	N/A	-36%	-36%
PM_{10}	N/A	N/A	0	0	N/A	1	1	N/A	-36%	-36%
$PM_{2.5}$	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%
Pb	N/A	N/A	0	0	N/A	0	0	N/A	-36%	-36%

Notes:

Red shaded cells indicate that the general conformity threshold is exceeded

[a] The minimum general conformity threshold was assigned for each pollutant within air basins that have multiple affected counties.

[b] GBVAB has attainment for all pollutants considered.

This page intentionally left blank.

ATTACHMENT 2-2

Summary of Emissions for Demolition, Excavation, and Offsite Disposal (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Equations differ from neighboring cells to incorporate fugitive dust emissions.

Demolition, Excavation, and Offsite Disposal Emissions

Emissions Location	Emissions (lbs/day)									Emissions (tons/year) [a]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb	CO_2	CH_4
Year 2014 [c]																		
SCCAB Emissions																		
Onsite	36	162	264	0	32	18	0	33,341	3	3	12	20	0	2	1	0	2,501	0
Offsite	0	1	1	0	0	0	0	298	0	0	0	0	0	0	0	0	22	0
Total	37	162	265	0	32	18	0	33,639	3	3	12	20	0	2	1	0	2,523	0
SCAB Emissions																		
Offsite	2	13	25	0	1	1	0	5,522	0	0	1	2	0	0	0	0	414	0
SJVAB Emissions																		
Offsite	1	7	20	0	1	1	0	3,779	0	0	0	2	0	0	0	0	283	0
Year 2016 [d]																		
SCCAB Emissions																		
Onsite	19	93	143	0	7,158	1,494	0	19,722	2	2	8	13	0	851	178	0	1,823	0
Offsite [e]	1	9	15	0	2	1	0	3,507	0	0	1	1	0	0	0	0	343	0
Total	21	102	158	0	7,160	1,495	0	23,229	2	2	9	14	0	851	178	0	2,166	0
SCAB Emissions																		
Offsite [e]	16	93	173	0	28	12	0	38,411	1	1	7	15	0	1	1	0	3,732	0
MDAB Emissions																		
Offsite	9	56	147	0	8	7	0	40,338	0	1	7	17	0	1	1	0	4,807	0
SJVAB Emissions																		
Offsite	7	39	104	0	6	5	0	25,544	0	1	5	12	0	1	1	0	3,044	0
GBVAB Emissions																		
Offsite	3	19	55	0	3	3	0	12,049	0	0	2	7	0	0	0	0	1,436	0
Nevada Emissions																		
Offsite	26	189	398	1	23	19	0	97,469	1	3	22	47	0	3	2	0	11,615	0
Utah Emissions																		
Offsite	4	26	54	0	3	3	0	13,258	0	0	3	6	0	0	0	0	1,580	0
Year 2017 [d]																		
SCCAB Emissions																		
Onsite	18	90	131	0	7,157	1,494	0	19,722	2	2	9	13	0	929	194	0	1,984	0
Offsite [e]	1	8	14	0	2	1	0	3,515	0	0	1	1	0	0	0	0	375	0
Total	19	99	145	0	7,160	1,495	0	23,237	2	2	10	14	0	929	194	0	2,358	0
SCAB Emissions																		
Offsite [e]	15	88	155	0	27	12	0	38,451	1	1	7	14	0	1	1	0	4,068	0
MDAB Emissions																		
Offsite	8	53	128	0	8	6	0	40,334	0	1	7	17	0	1	1	0	5,243	0
SJVAB Emissions																		
Offsite	6	36	91	0	5	4	0	25,542	0	1	5	12	0	1	1	0	3,321	0
GBVAB Emissions																		
Offsite	3	18	48	0	3	2	0	12,048	0	0	2	6	0	0	0	0	1,566	0
Nevada Emissions																		
Offsite	23	172	347	1	21	17	0	97,459	1	3	22	45	0	3	2	0	12,670	0
Utah Emissions																		
Offsite	3	23	47	0	3	2	0	13,256	0	0	3	6	0	0	0	0	1,723	0

Notes:

[a] Annual emissions were scaled to account for the actual duration of construction activity within each calendar year, as documented in Attachment 2-5.

[b] Scaling was not required for the fugitive dust emissions as they were scaled in Attachment 2-4 and Attachment 1-6.

[c] Emissions presented for Year 2014 are associated with demolition activities.

[d] Emissions presented for Years 2016 and 2017 are associated with excavation, material hauling, and road repair activities.

[e] Annual emissions from road repair, an offsite activity, were scaled by the number of rebuilds per year since the emissions per rebuild were estimated in Attachment 1-6.

This page intentionally left blank.

ATTACHMENT 2-3

Summary of GHG Emissions for Demolition, Excavation, and Offsite Disposal (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Demolition, Excavation, and Offsite Disposal GHG Emissions

Emissions Location	Emissions (metric tons/year)		
	CO_2	CH_4	CO_2e [a]
Year 2016 [c]			
SCCAB Emissions			
Total	1,965	0	1,968
SCAB Emissions			
Offsite	3,385	0	3,386
MDAB Emissions			
Offsite	4,361	0	4,362
SJVAB Emissions			
Offsite	2,761	0	2,762
GBVAB Emissions			
Offsite	1,303	0	1,303
Nevada Emissions			
Offsite	10,537	0	10,540
Utah Emissions			
Offsite	1,433	0	1,434
Total Year 2016	**25,745**	**0**	**25,755**
Year 2017 [c]			
SCCAB Emissions			
Total	2,139	0	2,142
SCAB Emissions			
Offsite	3,691	0	3,692
MDAB Emissions			
Offsite	4,757	0	4,758
SJVAB Emissions			
Offsite	3,012	0	3,013
GBVAB Emissions			
Offsite	1,421	0	1,421
Nevada Emissions			
Offsite	11,494	0	11,497
Utah Emissions			
Offsite	1,563	0	1,564
Total Year 2017	**28,077**	**0**	**28,087**

Notes:

[a] CO_2e emissions were estimated using the following global warming potentials: 1 for CO_2 and 21 for CH_4.

[b] Emissions presented for Year 2014 are associated with demolition activities.

[c] Emissions presented for Years 2016 and 2017 are associated with excavation, material hauling, and road repair activities.

This page intentionally left blank.

ATTACHMENT 2-4

Excavation Emissions (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Construction Equipment Emissions

Construction Equipment	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Year 2016																		
Rubber Tired Dozers	2.789	11.665	22.361	0.023	0.913	0.913	0.000	2,646.299	0.251	0.363	1.516	2.907	0.003	0.119	0.119	0.000	344.019	0.033
Concrete/Industrial Saws	0.808	4.719	5.777	0.008	0.434	0.434	0.000	740.820	0.072	0.105	0.613	0.751	0.001	0.056	0.056	0.000	96.307	0.009
Tractors/Loaders/Backhoes	1.571	10.367	10.569	0.016	0.758	0.758	0.000	1,550.419	0.139	0.204	1.348	1.374	0.002	0.099	0.099	0.000	201.554	0.018
Graders	1.213	7.303	8.616	0.013	0.475	0.475	0.000	1,238.080	0.109	0.158	0.949	1.120	0.002	0.062	0.062	0.000	160.950	0.014
Excavators	1.941	13.281	13.112	0.024	0.706	0.706	0.000	2,242.376	0.174	0.252	1.727	1.705	0.003	0.092	0.092	0.000	291.509	0.023
Scrapers	5.459	20.185	44.325	0.057	1.695	1.695	0.000	6,422.681	0.486	0.710	2.624	5.762	0.007	0.220	0.220	0.000	834.948	0.063
Total Onsite (Within the SCCAB) [c]	**13.782**	**67.519**	**104.760**	**0.141**	**4.982**	**4.982**	**0.000**	**14,840.674**	**1.231**	**1.792**	**8.778**	**13.619**	**0.018**	**0.648**	**0.648**	**0.000**	**1,929.288**	**0.160**
Year 2017																		
Rubber Tired Dozers	2.654	10.957	20.871	0.023	0.847	0.847	0.000	2,646.299	0.237	0.345	1.424	2.713	0.003	0.110	0.110	0.000	344.019	0.031
Concrete/Industrial Saws	0.726	4.686	5.326	0.008	0.383	0.383	0.000	740.818	0.065	0.094	0.609	0.692	0.001	0.050	0.050	0.000	96.306	0.008
Tractors/Loaders/Backhoes	1.430	10.315	9.639	0.016	0.647	0.647	0.000	1,550.419	0.128	0.186	1.341	1.253	0.002	0.084	0.084	0.000	201.554	0.017
Graders	1.133	7.294	7.773	0.013	0.427	0.427	0.000	1,238.080	0.100	0.147	0.948	1.011	0.002	0.056	0.056	0.000	160.950	0.013
Excavators	1.787	13.274	11.553	0.024	0.612	0.612	0.000	2,242.376	0.158	0.232	1.726	1.502	0.003	0.080	0.080	0.000	291.509	0.021
Scrapers	5.176	19.179	40.708	0.057	1.548	1.548	0.000	6,422.681	0.463	0.673	2.493	5.292	0.007	0.201	0.201	0.000	834.948	0.060
Total Onsite (Within the SCCAB) [c]	**12.906**	**65.705**	**95.870**	**0.141**	**4.464**	**4.464**	**0.000**	**14,840.672**	**1.152**	**1.678**	**8.542**	**12.463**	**0.018**	**0.580**	**0.580**	**0.000**	**1,929.287**	**0.150**

Notes:

[a] Daily Emissions = Emission Factor (g/bhp-hr) x Equipment Quantity X Horsepower x Load Factor x Hours of Operation per Day / 453.6 (g/lb).

[b] Annual emissions assume activities occur: 260 days per year

[c] All construction activities occur onsite, which is located within the SCCAB.

Construction Equipment Emission Factors

Construction Equipment	Emission Factors (g/bhp-hr) [a]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb [b, c]	CO_2	CH_4
Year 2016									
Rubber Tired Dozers	0.599	2.505	4.802	0.005	0.196	0.196	0.0000	568.299	0.054
Concrete/Industrial Saws	0.62	3.62	4.432	0.006	0.333	0.333	0.0000	568.3	0.055
Tractors/Loaders/Backhoes	0.576	3.8	3.874	0.006	0.278	0.278	0.0000	568.299	0.051
Graders	0.557	3.352	3.955	0.006	0.218	0.218	0.0000	568.299	0.05
Excavators	0.492	3.366	3.323	0.006	0.179	0.179	0.0000	568.299	0.044
Scrapers	0.483	1.786	3.922	0.005	0.15	0.15	0.0000	568.299	0.043
Year 2017									
Rubber Tired Dozers	0.57	2.353	4.482	0.005	0.182	0.182	0.0000	568.299	0.051
Concrete/Industrial Saws	0.557	3.595	4.086	0.006	0.294	0.294	0.0000	568.299	0.05
Tractors/Loaders/Backhoes	0.524	3.781	3.533	0.006	0.237	0.237	0.0000	568.299	0.047
Graders	0.52	3.348	3.568	0.006	0.196	0.196	0.0000	568.299	0.046
Excavators	0.453	3.364	2.928	0.006	0.155	0.155	0.0000	568.299	0.04
Scrapers	0.458	1.697	3.602	0.005	0.137	0.137	0.0000	568.299	0.041

Notes:

[a] Emission factors were obtained from Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[b] A lead emission factor for stationary and portable internal combustion engines was assumed representative of construction equipment. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010): 0.0083 lbs/1,000 gallons

[c] For construction equipment, assumed the following diesel fuel consumption per Table A9-8-C of the *CEQA Handbook* (SCAQMD, 1993): 0.066 gallons/bhp-hr

ATTACHMENT 2-4
Excavation Emissions (Low Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Fugitive Dust Emissions

Pollutant	Emissions (lbs/day)	Emissions (tons/year)
Year 2016		
Open Stockpile Fugitive Dust [a, b]		
PM_{10} Emissions	2,829.752	337.212
$PM_{2.5}$ Emissions [c]	588.588	70.140
Truck Loading Fugitive Dust [b, d]		
PM_{10} Emissions	1.541	0.184
$PM_{2.5}$ Emissions [c]	0.321	0.038
Earthmoving Fugitive Dust [e, f, g]		
PM_{10} Emissions	4,307.087	513.261
$PM_{2.5}$ Emissions [c]	895.874	106.758
PM_{10} Total Onsite (Within the SCCAB) [h]	**7,138.380**	**850.657**
$PM_{2.5}$ Total Onsite (Within the SCCAB) [h]	**1,484.783**	**176.937**
Year 2017		
Open Stockpile Fugitive Dust [a, b]		
PM_{10} Emissions	2,829.752	367.868
$PM_{2.5}$ Emissions [c]	588.588	76.516
Truck Loading Fugitive Dust [b, d]		
PM_{10} Emissions	1.541	0.200
$PM_{2.5}$ Emissions [c]	0.321	0.042
Earthmoving Fugitive Dust [e, f, g]		
PM_{10} Emissions	4,307.087	559.921
$PM_{2.5}$ Emissions [c]	895.874	116.464
PM_{10} Total Onsite (Within the SCCAB) [h]	**7,138.380**	**927.989**
$PM_{2.5}$ Total Onsite (Within the SCCAB) [h]	**1,484.783**	**193.022**

Notes:

[a] For open storage piles from Table A9-9 of the *CEQA Handbook* (SCAQMD, 1993), daily PM_{10} Emissions (lbs/day) = Area Covered by Storage Piles (acres) x Emission Factor (lbs/day/acre).

[b] Annual emissions for open stockpiles and truck loading were estimated assuming the entire allowable duration, as documented in Attachment 2-5.

[c] Per Appendix A of the *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006), $PM_{2.5}$ emissions from construction activities were assumed to be: 20.8% of the PM_{10} emissions

[d] For truck loading from Table A9-9 of the *CEQA Handbook* (SCAQMD, 1993), daily PM_{10} Emissions (lbs/day) = Material Handled (tons/day) x Emission Factor (lbs/ton).

[e] For earthmoving (cut/fill), daily PM_{10} Emissions (lbs/day) = Area Excavated (acres) / Monthly Schedule (days/month) x Construction Activity Emission Factor (lbs/acre-month) + Daily Material Handled (tons/day) / Material Density (tons/cy) x Onsite Cut/Fill Emission Factor (lbs/1,000 cy).

[f] For earthmoving (cut/fill), made the following assumptions:

Material Density:	1.34	tons/cy	(documented in Attachment 2-5)
Monthly Schedule:	22	days per month	(consistent with the schedule documented in Attachment 1-6)

[g] Annual emissions for earthmoving were estimated assuming the same duration as excavation activities, as documented in Attachment 2-5.

[h] All construction activities occur onsite, which is located within the SCCAB.

ATTACHMENT 2-4
Excavation Emissions (Low Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Fugitive Dust Emission Factors

Construction Element	Emission Factors	
	PM_{10}	Units
Open Stockpile Fugitive Dust [a]	85.6	lbs/day/acre
Truck Loading Fugitive Dust [b]	0.0014	lbs/ton
Earthmoving Fugitive Dust [c]		
Construction Activity	0.11	ton/acre-month
	220	lbs/acre-month
Onsite Cut/Fill	0.059	ton/1,000 cy
	118	lbs/1,000 cy

Notes:

[a] Default emission factor for open storage piles from Table A9-9 from the *CEQA Handbook* (SCAQMD, 1993).

[b] Emission factor for truck loading was calculated using Table A9-9-G from the *CEQA Handbook* (SCAQMD, 1993) as follows:

Emission Factor (lbs/ton) = 0.00112 x {[(Average Wind Speed / 5) ^ 1.3] / [(Dirt Moisture Content / 2) ^ 1.4]}

Average Wind Speed:	6.0	mph	(value of 2.69 m/s, as measured onsite)
Dirt Moisture Content:	2.0	%	(assumed dry soil)

[c] Default emission factor for earthmoving (cut/fill) from Table A-4 of Appendix A of the *Software User's Guide: URBEMIS2007 for Windows* (JSA, 2007).

Vehicle Emissions

Vehicle Type	Emissions (lbs/day) [a]									Emissions (tons/year) [b]								
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2	CH_4
Onsite Emissions for Year 2016 [c]																		
Crew Vans [d]	0.001	0.016	0.001	0.000	0.000	0.000	0.000	4.994	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.649	0.000
Offsite Emissions for Year 2016 [c]																		
Travel Within the SCCAB																		
Removal Haul Truck Travel [e]	0.001	0.007	0.013	0.000	0.001	0.001	0.000	3.575	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.465	0.000
Backfill Haul Truck Travel [e]	0.060	0.464	0.856	0.002	0.048	0.039	0.000	235.962	0.003	0.008	0.060	0.111	0.000	0.006	0.005	0.000	30.675	0.000
Worker Commute [f]	0.003	0.116	0.011	0.000	0.003	0.002	0.000	35.930	0.001	0.000	0.015	0.001	0.000	0.000	0.000	0.000	4.671	0.000
Total Offsite (Within the SCCAB)	**0.063**	**0.587**	**0.880**	**0.003**	**0.052**	**0.041**	**0.000**	**275.467**	**0.005**	**0.008**	**0.076**	**0.114**	**0.000**	**0.007**	**0.005**	**0.000**	**35.811**	**0.001**
Travel Within the SCAB																		
Removal Haul Truck Travel [e]	0.226	1.470	3.278	0.008	0.191	0.156	0.000	841.176	0.011	0.029	0.191	0.426	0.001	0.025	0.020	0.000	109.353	0.001
Backfill Haul Truck Travel [e]	0.043	0.278	0.619	0.002	0.036	0.029	0.000	158.849	0.002	0.006	0.036	0.080	0.000	0.005	0.004	0.000	20.650	0.000
Worker Commute [f]	0.024	1.182	0.109	0.004	0.035	0.017	0.000	374.522	0.013	0.003	0.154	0.014	0.000	0.005	0.002	0.000	48.688	0.002
Total Offsite (Within the SCAB)	**0.293**	**2.929**	**4.006**	**0.013**	**0.262**	**0.203**	**0.001**	**1,374.546**	**0.027**	**0.038**	**0.381**	**0.521**	**0.002**	**0.034**	**0.026**	**0.000**	**178.691**	**0.003**
Travel Within the MDAB																		
Removal Haul Truck Travel [e]	0.277	1.666	4.336	0.012	0.251	0.204	0.000	1,193.540	0.014	0.036	0.217	0.564	0.002	0.033	0.026	0.000	155.160	0.002
Travel Within the SJVAB																		
Removal Haul Truck Travel [e]	0.198	1.143	3.086	0.007	0.177	0.145	0.000	755.798	0.010	0.026	0.149	0.401	0.001	0.023	0.019	0.000	98.254	0.001
Travel Within the GBVAB																		
Removal Haul Truck Travel [e]	0.100	0.565	1.640	0.003	0.089	0.074	0.000	356.512	0.005	0.013	0.073	0.213	0.000	0.012	0.010	0.000	46.347	0.001
Travel Within Nevada																		
Removal Haul Truck Travel [e]	0.770	5.586	11.779	0.028	0.674	0.553	0.001	2,883.965	0.039	0.100	0.726	1.531	0.004	0.088	0.072	0.000	374.915	0.005
Travel Within Utah																		
Removal Haul Truck Travel [e]	0.105	0.760	1.602	0.004	0.092	0.075	0.000	392.277	0.005	0.014	0.099	0.208	0.000	0.012	0.010	0.000	50.996	0.001
Onsite Emissions for Year 2017 [c]																		
Crew Vans [d]	0.001	0.014	0.001	0.000	0.000	0.000	0.000	4.985	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.648	0.000

ATTACHMENT 2-4
Excavation Emissions (Low Soil Removal Estimate)
NASA SSFL EIS: Air Quality

Offsite Emissions for Year 2017 [c]																		
Travel Within the SCCAB																		
Removal Haul Truck Travel [e]	0.001	0.006	0.012	0.000	0.001	0.001	0.000	3.586	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.466	0.000
Backfill Haul Truck Travel [e]	0.054	0.423	0.760	0.002	0.045	0.036	0.000	236.683	0.003	0.007	0.055	0.099	0.000	0.006	0.005	0.000	30.769	0.000
Worker Commute [f]	0.002	0.104	0.010	0.000	0.003	0.002	0.000	35.864	0.001	0.000	0.014	0.001	0.000	0.000	0.000	0.000	4.662	0.000
Total Offsite (Within the SCCAB)	**0.057**	**0.534**	**0.781**	**0.003**	**0.048**	**0.038**	**0.000**	**276.133**	**0.004**	**0.007**	**0.069**	**0.102**	**0.000**	**0.006**	**0.005**	**0.000**	**35.897**	**0.001**
Travel Within the SCAB																		
Removal Haul Truck Travel [e]	0.202	1.355	2.879	0.008	0.175	0.141	0.000	842.332	0.010	0.026	0.176	0.374	0.001	0.023	0.018	0.000	109.503	0.001
Backfill Haul Truck Travel [e]	0.038	0.256	0.544	0.002	0.033	0.027	0.000	159.067	0.002	0.005	0.033	0.071	0.000	0.004	0.003	0.000	20.679	0.000
Worker Commute [f]	0.022	1.081	0.099	0.004	0.035	0.017	0.000	373.917	0.012	0.003	0.141	0.013	0.000	0.005	0.002	0.000	48.609	0.002
Total Offsite (Within the SCAB)	**0.262**	**2.692**	**3.522**	**0.013**	**0.243**	**0.185**	**0.001**	**1,375.316**	**0.024**	**0.034**	**0.350**	**0.458**	**0.002**	**0.032**	**0.024**	**0.000**	**178.791**	**0.003**
Travel Within the MDAB																		
Removal Haul Truck Travel [e]	0.248	1.576	3.792	0.012	0.230	0.184	0.000	1,193.414	0.012	0.032	0.205	0.493	0.002	0.030	0.024	0.000	155.144	0.002
Travel Within the SJVAB																		
Removal Haul Truck Travel [e]	0.177	1.069	2.686	0.007	0.160	0.130	0.000	755.761	0.009	0.023	0.139	0.349	0.001	0.021	0.017	0.000	98.249	0.001
Travel Within the GBVAB																		
Removal Haul Truck Travel [e]	0.089	0.519	1.418	0.003	0.081	0.066	0.000	356.497	0.004	0.012	0.067	0.184	0.000	0.011	0.009	0.000	46.345	0.001
Travel Within Nevada																		
Removal Haul Truck Travel [e]	0.690	5.092	10.254	0.028	0.611	0.497	0.001	2,883.661	0.035	0.090	0.662	1.333	0.004	0.079	0.065	0.000	374.876	0.005
Travel Within Utah																		
Removal Haul Truck Travel [e]	0.094	0.693	1.395	0.004	0.083	0.068	0.000	392.236	0.005	0.012	0.090	0.181	0.000	0.011	0.009	0.000	50.991	0.001

Notes:

[a] Daily Emissions (lbs/day) = Quantity of Vehicles x Daily VMT (miles/day) x Emission Factor (g/mile) / 453.6 (g/lb).

[b] Annual emissions were estimated assuming activities occur: 260 days per year

[c] Onsite emissions all occur within the SCCAB; offsite emissions were distributed amongst the air basins based on the haul routes for each vehicle, as presented in Attachment 1-9.

[d] Assumed crew members were transported around the site using one crew van; the emissions for Crew Vans were estimated using emission factors for 'Passenger Vehicles'.

[e] Emissions for Haul Trucks were estimated using emission factors for 'Heavy-Heavy Duty Trucks'. The daily and annual emissions will be multiplied by the quantity of vehicles in Attachment 2-2.

[f] Assumed workers live in Ventura County and Los Angeles County as listed below. It was also assumed workers commute in passenger vehicles.

Ventura County	50%
Los Angeles County	50%

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]								
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]	CO_2	CH_4
2016 Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.069	1.809	0.127	0.005	0.043	0.028	0.0001	566.303	0.026
Heavy-Heavy Duty Trucks [e]	1.659	7.099	8.730	0.024	0.427	0.356	0.001	2,545.962	0.079
2016 Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.022	0.999	0.095	0.003	0.028	0.014	0.0001	310.434	0.011
Heavy-Heavy Duty Trucks [e]	0.409	3.191	5.884	0.016	0.330	0.267	0.001	1,621.704	0.022
SCAB Emission Factors									
Passenger Vehicles [d]	0.020	0.979	0.090	0.003	0.029	0.014	0.0001	310.289	0.011
Heavy-Heavy Duty Trucks [e]	0.440	2.861	6.382	0.016	0.371	0.304	0.001	1,637.585	0.022
MDAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.382	2.300	5.985	0.016	0.347	0.281	0.001	1,647.565	0.019
SJVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.432	2.492	6.729	0.016	0.385	0.316	0.001	1,648.220	0.021

ATTACHMENT 2-4
Excavation Emissions (Low Soil Removal Estimate)
NASA SSFL EIS: Air Quality

GBVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.462	2.613	7.589	0.016	0.414	0.343	0.001	1,650.140	0.022
Nevada Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.440	3.191	6.729	0.016	0.385	0.316	0.001	1,647.565	0.022
Utah Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.440	3.191	6.729	0.016	0.385	0.316	0.001	1,647.565	0.022
2017 Onsite Emission Factors (15 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.060	1.644	0.115	0.005	0.043	0.028	0.0001	565.310	0.024
Heavy-Heavy Duty Trucks [e]	1.497	6.269	7.940	0.024	0.375	0.308	0.001	2,552.056	0.071
2017 Offsite Emission Factors (55 mph)									
SCCAB Emission Factors									
Passenger Vehicles [d]	0.019	0.902	0.085	0.003	0.028	0.014	0.0001	309.866	0.010
Heavy-Heavy Duty Trucks [e]	0.370	2.909	5.220	0.016	0.306	0.245	0.001	1,626.658	0.020
SCAB Emission Factors									
Passenger Vehicles [d]	0.018	0.896	0.082	0.003	0.029	0.014	0.0001	309.788	0.010
Heavy-Heavy Duty Trucks [e]	0.394	2.637	5.605	0.016	0.340	0.275	0.001	1,639.836	0.020
MDAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.343	2.175	5.235	0.016	0.317	0.254	0.001	1,647.391	0.017
SJVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.385	2.331	5.858	0.016	0.349	0.284	0.001	1,648.140	0.019
GBVAB Emission Factors									
Heavy-Heavy Duty Trucks [e]	0.410	2.402	6.563	0.016	0.374	0.306	0.001	1,650.070	0.020
Nevada Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.394	2.909	5.858	0.016	0.349	0.284	0.001	1,647.391	0.020
Utah Emission Factors									
Heavy-Heavy Duty Trucks [f]	0.394	2.909	5.858	0.016	0.349	0.284	0.001	1,647.391	0.020

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007 for each air basin, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all air basins, all vehicle speeds, and all construction years: 0.0083 lbs/1,000 gallons

[d] Per Table 4-23 of the *National Transportation Statistics* (BTS, 2011), assumed a passenger fuel economy of: 33.7 miles per gallon

[e] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

[f] As a conservative estimate, the maximum California emission factors were assumed representative of Nevada and Utah.

This page intentionally left blank.

ATTACHMENT 2-5

Excavation Data (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Activity Durations for Annual Scaling [a]

Excavation Duration (Days) [b]	
Construction Year 2016	238
Construction Year 2017	260
Material Hauling / Stockpile Duration (Days) [c]	
Construction Year 2016	238
Construction Year 2017	260

Notes:

[a] The durations presented were used to scale annual emissions based on a full 260 day schedule to match the actual project schedule.

[b] For excavation, the 2016 duration accounts for activities beginning in February 2016 per the schedule provided. Excavation activities would also occur in 2017 if the required duration was longer than the 11 months of 2016.

[c] For material hauling, the 2016 duration accounts for activities beginning in February 2016 per the schedule provided. It was assumed that material hauling would take the entire allowable duration. Stockpiling would be necessary from the start of excavation (simultaneous with material hauling) to the completion of material hauling.

Excavation Schedule for the Low Soil Removal Estimate [a]

Excavation Start Date (Month and Year) [b]	February 2016
Excavation Duration (Months)	23
Excavation Duration (Days)	498
Work Days per Week [c]	5
Work Hours per Day [d]	10

Notes:

[a] Per Section 1.2.2 of the SSFL EIS, the NASA-administered area over which excavation activities occur is: 421.2 acres

[b] The SSFL EIS indicates that excavation activities for the Proposed Action will occur from February 2016 to December 2017. Assume material hauling begins at the same time. Hauling duration is presented in 'Soil Hauling Truck Estimates' table.

[c] Assume excavation and hauling activities occur 5 days per week.

[d] To allow for heightened activity, assume excavation activities occur up to 10 hours per day within the SSFL operational hours of 7 a.m. to 7 p.m. Per R. Dean/CH2M HILL, this is consistent with the Boeing ISRA activities (RE: SSFL EIS - AQ Calculations Table.msg).

Soil Hauling Truck Estimates for the Low Soil Removal Estimate

Truck Capacity (cy/truck) [a]	19

ATTACHMENT 2-5

Excavation Data (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Removal Volume (cy) [b]	320,000
Removal Trucks	16,842
Removal Frequency (trucks/day) [c]	34
Backfill Volume (cy) [d]	106,667
Backfill Trucks	5,614
Backfill Frequency (trucks/day) [c]	11
Hauling Duration (days)	498
Daily Material Handled (tons/day) [e]	1,081

Notes:

[a] According to C. Brady/Kettleman Hills Landfill (559-318-6086), a realistic average load for light-weight truck and trailer combinations is 19 cy (approximately 24 tons).

[b] Removal volumes (cy) provided by J. Glasgow/CH2M HILL (NASA SSFL EIS Soil Volumes.msg).

[c] The frequency of trucks was back-calculated from the maximum duration (hauling must be completed by 2017) and the total trucks necessary to off-haul the soil or bring in clean backfill.

[d] According to L. Tice/CH2M HILL and J. Glasgow/CH2M HILL (RE: SSFL EIS - AQ Calculations Table(2).msg), up to 1/3rd of the soil excavated will be replaced using clean backfill taken from onsite areas adjacent to the excavation areas. Since the clean backfill will be from an onsite source, additional offsite truck hauling will not be required. Additionally, the backfilling activities will be performed using the excavation equipment during downtime. Assume stockpiling of the backfill is not required.

[e] Estimated the Daily Material Handled by considering the total removal and backfill volumes, a soil density of 24 tons per 19 cy (per note a above), and the number of active days in 2016 through 2017 (during which stockpiles may be formed or trucks may be loaded).

ATTACHMENT 2-5

Excavation Data (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Excavation Equipment Estimates for the Low Soil Removal Estimate

Equipment Type [a]	Quantity [a]	Daily Hours of Operation [b]	Horsepower [c]	Load Factor [c]
Rubber Tired Dozers	1	10	358	0.59
Concrete/Industrial Saws	1	10	81	0.73
Tractors/Loaders/Backhoes	3	10	75	0.55
Graders	1	10	162	0.61
Excavators	2	10	157	0.57
Scrapers	2	10	356	0.72

Notes:

[a] The equipment list and quantity of each equipment type were taken as the maximum possible equipment counts for grading from Table 3.2 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

[b] Assumed each equipment would operate 10 hours per day, consistent with the schedule provided in the 'Excavation Schedule' table.

[c] Horsepower and load factors taken as the average for each equipment type from Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Environ, 2011).

Stockpile Estimates for the Low Soil Removal Estimate

Stockpiles Utilized (Y or N) [a]	Yes
Number of Stockpiles [b]	240
Maximum Size of Stockpiles (acres) [c]	0.14

Notes:

[a] As a conservative estimate, assumed that the stockpiles would be used from the start of excavation/hauling activities to the end of hauling activities, which coincides with the total hauling duration.

[b] Number of Stockpiles was estimated based on the total soil removal and backfill volumes, the Maximum Size of Stockpiles, and the conservative assumption that, per SCAQMD Rule 1157(d)(6)(C), each stockpile has a maximum height of: 8 feet

[c] Based on VCAPCD Rule 74.29, Maximum Size of Stockpiles conservatively assumed to be: 6,000 square feet

ATTACHMENT 2-5

Excavation Data (Low Soil Removal Estimate)

NASA SSFL EIS: Air Quality

Crew Member Estimates for the Low Soil Removal Estimate

Round Trip Distance Traveled to Site (miles) [a, b]	40
Round Trip Distance Traveled Onsite (miles) [a, c]	4
Number of Crew Members [d]	15

Notes:

[a] Assumed that crew members travel to the site using personal vehicles and are transported around the site using 15-passenger vans.

[b] The round trip distance crew members may travel to the site was estimated at 40 miles due to the isolated site and surrounding city locations.

[c] The round trip distance crew members may travel onsite was assumed to be the same distance as that for demolition activities (see Attachment 1-7).

[d] Assumed 15 crew members to allow for at least one crew member per excavation equipment and a few extras.

Worker Commute from Los Angeles County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	39	98%	SCAB
Ventura	1	3%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. If employees live in Los Angeles County, all travel takes place in Los Angeles County once the employee crosses the Los Angeles County border, located approximately 1 mile from the facility entrance.

Worker Commute from Ventura County

County	Roundtrip Distance (miles) [a]	Percent of Trip Distance	Air Basin
Los Angeles	34	85%	SCAB
Ventura	6	15%	SCCAB
Total	**40**	**100%**	

Notes:

[a] Per project-specific data, the roundtrip distance (miles) for commuting is 40 miles. The distance traveled within Los Angeles and Ventura counties was estimated assuming employees travel within Los Angeles County to reach Highway 118 and travel a bit beyond the location for asphalt disposal, as described in Attachment 1-7.

End of Appendix H

This page intentionally left blank.

APPENDIX I

Air Quality General Conformity Analysis

This page intentionally left blank.

APPENDIX I

Air Quality General Conformity Analysis

PREPARED FOR: National Aeronautics and Space Administration

PREPARED BY: CH2M HILL

DATE: June 2013

This technical memorandum provides a detailed technical approach for the General Conformity screening analysis conducted in support of the *Environmental Impact Statement for Proposed Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory (SSFL)*, including supplemental information and a description of the methodologies and assumptions used for this study. The supplemental information and methodologies discussed are as follows:

- Compliance
- Threshold Values
- Methodology
- Results

Note that the methodology and results presented in this appendix pertain only to a screening analysis performed prior to the final emission calculations presented in the Environmental Impact Statement (EIS). This screening analysis was conducted to give a preliminary indication of the potential project impacts associated with the Excavation and Offsite Disposal technology (high soil removal estimate) described in Section 4.7 of the EIS. As discussed later within this appendix, this screening analysis was not redone as new information became available because the new information was fully captured in the final emission calculations presented in Section 4.7.

Compliance

To decide whether projects require a General Conformity analysis, the U.S. Environmental Protection Agency (EPA) has established General Conformity *de minimis*[1] threshold values (in tons per calendar year) for each of the criteria pollutants for each type of designated nonattainment and maintenance area. If the annual emissions generated by a project on an area-wide basis (i.e., per air basin) are less than these threshold values, a General Conformity analysis is not required. If the emissions are greater than these threshold values, compliance with the General Conformity Rule must be demonstrated.

Compliance with the General Conformity Rule can be demonstrated in one or more of the following ways and must be completed before construction begins:

- By reducing emissions to below the General Conformity *de minimis* threshold values
- By showing that the emissions are included in the area's emission budget for the state implementation plan (SIP)
- By demonstrating that the state agrees to include the emission increases in the area's SIP without exceeding emission budgets
- By offsetting the project's emissions in each year that the General Conformity *de minimis* threshold values are exceeded
- By an air quality modeling analysis demonstrating the project would not cause or exacerbate a national ambient air quality standard (NAAQS)

[1] Proposed Actions with emissions below the applicable *de minimis* threshold are those that are not considered to have a significant environmental impact per 40 *Code of Federal Regulations* (CFR) Parts 51 and 93. The *de minimis* thresholds correspond to the emission rates defined in 40 CFR 51.165-51.166 as "significant" (71 Federal Register [FR] 40420).

As discussed in Section 4.7 of the EIS and later in this appendix, NASA would need to demonstrate conformance for the Excavation and Offsite Disposal technology (high soil removal estimate)[2]. NASA plans to conform by purchasing criteria pollutant offsets for the affected counties. The quantity of criteria pollutant offsets purchased would equal the quantity by which the General Conformity *de minimis* threshold values are exceeded.

Threshold Values

As presented in Appendix H, multiple counties potentially might be affected by the Excavation and Offsite Disposal technology as a result of material and equipment hauling. The attainment statuses of these counties are presented in Appendix H. The associated General Conformity *de minimis* threshold values for each of these counties are summarized in Table I-1. Note that Table I-1 only presents the General Conformity *de minimis* threshold values for counties designated as nonattainment or maintenance for at least one criteria pollutant.

General Conformity is evaluated separately for each air basin and Table I-2 presents the threshold value for each criteria pollutant within each air basin potentially affected by the Excavation and Offsite Disposal technology. Similar to Table I-1, Table I-2 only presents the counties designated as nonattainment or maintenance areas for at least one criteria pollutant. If an air basin included multiple counties designated as nonattainment or maintenance, then the most stringent threshold for each criteria pollutant was considered.

Precursors are compounds known to contribute to the formation of established criteria pollutants and are evaluated against the General Conformity *de minimis* threshold values for the criteria pollutants they form. Nitrogen oxides (NOx) and volatile organic compounds (VOCs) are considered ozone precursors and sulfur dioxide (SO_2), NOx, and VOCs are considered precursors to particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less ($PM_{2.5}$). For ozone, project NOx and VOC emissions are estimated and compared to the ozone General Conformity *de minimis* threshold value. Because NOx is also a $PM_{2.5}$ precursor, the General Conformity *de minimis* threshold value used for comparison against project NOx emissions would be the most conservative threshold (the minimum threshold) available. The threshold values presented in Table I-2 take precursors into consideration.

Methodology

To understand the potential impacts to air quality as a result of the Excavation and Offsite Disposal technology (high soil removal estimate), a screening analysis was performed to identify whether the General Conformity *de minimis* threshold values could be met given the project constraints (that is, pre-determined soil removal volumes and limited activity duration). This was done by back-calculating the soil volumes that feasibly could be removed within the allotted duration from the General Conformity *de minimis* threshold values. The resulting values were compared to the project's predetermined soil removal volumes. Note that this analysis was only performed for counties designated as nonattainment or maintenance areas for at least one criteria pollutant.

[2] Note that the low soil removal estimate or other remedial technologies requiring Excavation and Offsite Disposal also would warrant the need to conform, as discussed throughout Section 4.7.

TABLE I-1
General Conformity *De Minimis* Threshold Values
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

County	California Air Basin or State	General Conformity *De Minimis* Threshold Values (tpy) [a, b]						
		Ozone	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	Lead
Ventura	SCCAB	50	N/A	N/A	N/A	N/A	N/A	N/A
Los Angeles	SCAB	10	70	100	100	N/A	N/A	25
San Bernardino	SCAB	10	70	100	100	N/A	N/A	N/A
	MDAB	100 [c]	100	N/A	N/A	N/A	N/A	N/A
Kern	SJVAB	10	70	100	N/A	N/A	N/A	N/A
Kings	SJVAB	10	100	100	N/A	N/A	N/A	N/A
Clark	Nevada	100 [d]	70	N/A	100	N/A	N/A	N/A
White Pine	Nevada	N/A	N/A	N/A	N/A	N/A	100	N/A
Tooele	Utah	N/A	N/A	N/A	N/A	N/A	100	N/A

Notes:
CO = carbon monoxide
MDAB = Mojave Desert Air Basin
N/A = Not applicable because the area is in attainment
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
SCCAB = South Central Coast Air Basin
SCAB = South Coast Air Basin
SJVAB = San Joaquin Valley Air Basin
SO_2 = sulfur dioxide
tpy = tons per year
[a] General Conformity *de minimis* threshold values from 40 Code of Federal Regulations (CFR) Parts 51 and 93.
[b] Refer to Appendix H for details about which counties are in partial nonattainment, maintenance, or attainment areas, thus dictating the applicable threshold.
[c] California is not located in an ozone transportation region. As a result, the General Conformity *de minimis* threshold value for an ozone attainment status of "Moderate Nonattainment" was taken as 100 tpy.
[d] Per 76 *Federal Register* (FR) 17373, the designation status of the Clark County ozone nonattainment area remains nonattainment despite the EPA's determination that the area has attained the NAAQS. Because Clark County is not located in an ozone transportation region, the General Conformity *de minimis* threshold value of 100 tpy was used.

TABLE I-2

Threshold Values Applicable to the Project

NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

	General Conformity *De Minimis* Threshold Values (tpy)						
California Air Basin or State	**VOC**	**CO**	**NOx**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**Lead**
SCCAB	50	N/A	50	N/A	N/A	N/A	N/A
SCAB [a]	10	100	10	100	70	100	25
MDAB	100	N/A	100	N/A	100	N/A	N/A
SJVAB [a]	10	N/A	10	100	70	100	N/A
Nevada [a]	100	100	100	100	70	N/A	N/A
Utah	N/A	N/A	N/A	100	N/A	N/A	N/A

Notes:
CO = carbon monoxide
MDAB = Mojave Desert Air Basin
N/A = Not applicable because the area is in attainment
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less
PM_{10} = particulate matter having an aerodynamic equivalent diameter of 10 microns or less
SCCAB = South Central Coast Air Basin
SCAB = South Coast Air Basin
SJVAB = San Joaquin Valley Air Basin
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compound

[a] The minimum threshold value was assigned for each pollutant within air basins that have multiple affected counties.

The first step in the screening analysis was calculating the annual vehicle miles traveled (VMT) by material haul trucks and the annual number of material haul truck trips possible based on the General Conformity *de minimis* threshold values. This was computed using the following equations for each criteria pollutant:

$$Annual\ VMT\ (miles/year) = \frac{[Threshold\ Value\ (tpy) - \ Constant\ Emissions\ (tpy)]x\ 907{,}185\ (g/ton)}{Haul\ Truck\ Emission\ Factor\ \ (g/mile)}$$ [3]

$$Annual\ Truck\ Trips(trips/year) = \frac{Annual\ VMT\ (miles/year)}{Maximum\ Distance\ Traveled\ per\ Round\ Trip\ (miles/trip)}$$

The constant emissions included in the previous equation were estimated from the activities that would occur regardless of material hauling, which include emissions from onsite excavation activities, emissions from worker commutes, and fugitive dust emissions from earthmoving and stockpiles. Although road repair activities would not occur without material hauling, the magnitude of road repair activities would be independent of the magnitude of material hauling. As a result, emissions from road repair activities were considered to be constant emissions.

The second step in the screening analysis was calculating the annual material that could be hauled using the annual truck trips determined in the first step of the screening analysis. This was computed using the following equation for each criteria pollutant:

$$Annual\ Material\ Hauled\ (tons/year) = Annual\ Truck\ Trips\ (trips/year)\ x\ Truck\ Capacity\ (cy/truck)$$ [4]

Once estimated, the annual material hauled quantities for both years of environmental cleanup activities were summed, resulting in a total soil volume capable of being removed by the project based on the General Conformity *de minimis* threshold values. Because this value was determined separately for each criteria pollutant, the smallest number estimated, regardless of pollutant, was compared to the project's pre-determined soil removal volumes. If the total possible soil volume was greater than the pre-determined soil removal volumes, the General Conformity *de minimis* threshold values could be met with the project constraints. If the total possible soil volume was less than the pre-determined soil removal volumes, the General Conformity *de minimis* threshold values would not be met.

If the total possible soil volume capable of being removed by the project indicated an exceedance of the General Conformity *de minimis* threshold values, a secondary analysis was performed using the minimum distance hauled within each county instead of the maximum distance. If the resulting total possible soil volume was greater than the pre-determined soil volumes, some landfill destinations would be preferable to others. If the resulting total possible soil volume was less than the pre-determined soil volumes, the General Conformity *de minimis* threshold values would not be met regardless of landfill selected and the project would need to demonstrate conformance for at least each criteria pollutant causing an exceedance.

Results

The previous screening analysis was performed for the Excavation and Offsite Disposal technology (high soil removal estimate). The analysis results are described in the following subsections and summarized in Table I-3.

[3] Haul truck emission factors (grams [g] per mile) were taken from the California Air Resources Board's (ARB's) EMFAC2007 (version 2.3) model (ARB, 2006) using the model parameters documented in Appendix H. The maximum California emission factor for each pollutant conservatively was used to represent Nevada and Utah vehicle emission factors.

[4] A truck capacity of 19 cubic yards was used, as consistent with the truck capacity reported in Table 4.7-3.

TABLE I-3
Screening Analysis Results
NASA SSFL EIS for Proposed Demolition and Environmental Cleanup

		General Conformity *De Minimis* Threshold Values Exceeded?
County	**California Air Basin or State**	**Excavation and Offsite Disposal Technology (High Soil Removal Estimate)**
Ventura	SCCAB	No
Los Angeles	SCAB	Yes, NOx
San Bernardino	SCAB	No
	MDAB	No
Kern	SJVAB	Yes, NOx
Kings	SJVAB	No
Clark	Nevada	No
White Pine	Nevada	No
Tooele	Utah	No

Notes:
MDAB = Mojave Desert Air Basin
NOx = nitrogen oxides
SCCAB = South Central Coast Air Basin
SCAB = South Coast Air Basin
SJVAB = San Joaquin Valley Air Basin

As listed in Table I-3, the South Coast Air Basin (SCAB) and San Joaquin Valley Air Basin (SJVAB) are the two air basins beyond the project site that potentially might be affected by material-hauling activities. This result led to the inclusion of the SCAB and SJVAB in the region of influence (ROI) defined in Section 3.5 of the EIS. Because SSFL physically is located in Ventura County, the South Central Coast Air Basin (SCCAB) also is included in the ROI so that the constant emissions (demolition, excavation, and fugitive dust) can be evaluated adequately.

NASA must demonstrate conformance for each air basin in which the NOx General Conformity *de minimis* threshold values are exceeded, in this case within the SCAB and SJVAB. As would be discussed with the air districts governing each of these air basins, NASA plans to conform by adhering to an annual truck limit based on the daily truck frequencies presented in Table 4.7-1 of the EIS and by purchasing NOx offsets for the affected counties. The quantity of NOx offsets purchased would equal the quantity by which the General Conformity *de minimis* threshold values are exceeded; for the Excavation and Offsite Disposal technology (high soil removal estimate), these values are presented in Table 4.7-4of the EIS.

Excavation and Offsite Disposal Technology

The total possible soil volumes estimated for Ventura, San Bernardino, Kings, Clark, White Pine, and Tooele counties were greater than the soil removal volume defined for the Excavation and Offsite Disposal technology (high soil removal estimate); therefore, the General Conformity *de minimis* threshold values would be met in those counties. The total possible soil volumes estimated for Los Angeles and Kern counties were less than the soil removal volume defined for the high soil removal estimate (Attachment 1). The total possible soil volumes were re-estimated for Los Angeles and Kern counties using the minimum distance hauled within each county; however, this calculation also resulted in total possible soil volumes less than the soil removal volume defined for the high soil removal estimate. As a result, the General Conformity *de minimis* threshold values could not be met with implementation of the project constraints. For both counties, the limiting criteria pollutant was NOx.

Because the identified landfills require material haul trucks to pass through Los Angeles County, NASA must demonstrate conformance for the SCAB regardless of the landfill used for offsite disposal of excavated soil. However, only two of the identified landfills require material haul trucks to pass through Kern County. As a result,

NASA must only demonstrate conformance for the SJVAB if the Kettleman Hills Landfill or the Clean Harbors Buttonwillow Landfill is used for offsite disposal of excavated soil.

Disclaimer

As noted at the beginning of this appendix, the screening analysis was performed before the final emission calculations were prepared and presented in the EIS. The screening analysis was performed assuming that the backfill was provided using onsite sources. Since the screening analysis was performed, additional information was provided suggesting that backfill might be brought to SSFL from offsite aggregate suppliers located in Ventura and Los Angeles counties. The screening analysis was not redone to incorporate this new information because the conclusions would not change, per the following discussion:

- Using the screening analysis, the total possible soil volumes estimated for Ventura County are at least 500 times greater than the pre-determined soil removal volumes. Although increasing the maximum distance hauled in Ventura County and increasing the predetermined soil volumes to include backfill would decrease this margin by a factor of 100, the overall results of the screening analysis would remain unchanged. As a result, Ventura County would still have emissions less than the applicable General Conformity *de minimis* threshold values.
- Using the screening analysis, the total possible soil volumes estimated for Los Angeles County are at most 1.3 times smaller than the pre-determined soil removal volumes. Although increasing the maximum distance hauled in Los Angeles County and increasing the predetermined soil volumes to include backfill would increase this margin by a factor of 1, the overall results of the screening analysis would remain unchanged. As a result, Los Angeles County would still have emissions greater than the applicable General Conformity *de minimis* threshold values and NASA would still need to demonstrate conformance within the SCAB. Because accounting for the backfill material haul trips would increase the soil volume margin, the quantity of NOx offsets required for purchase would be greater than predicted under the original screening analysis.
- Kern County would not be affected by the inclusion of backfill material haul trips because the possible aggregate suppliers are located only within Ventura and Los Angeles counties. As a result, Kern County would still have emissions greater than the applicable General Conformity *de minimis* threshold values and NASA would still need to demonstrate conformance within the SJVAB if either Kettleman Hills Landfill or Clean Harbors Buttonwillow Landfill is used for offsite disposal of excavated soil.
- San Bernardino, Kings, Clark, White Pine, and Tooele counties would not be affected by the inclusion of backfill material haul trips because the possible aggregate suppliers are located only within Ventura and Los Angeles counties. As a result, these counties would still have emissions less than the applicable General Conformity *de minimis* threshold values.

Summary

This screening analysis was performed to help identify the potential project impacts, as related to General Conformity, given the project constraints (pre-determined soil removal volumes and limited activity duration). Based on this screening analysis, the Excavation and Offsite Disposal technology (high soil removal estimate) would cause an exceedance of the NOx General Conformity *de minimis* threshold values in both the SCAB and the SJVAB. This result is consistent with the information presented in Section 4.7. Although additional information was obtained after the screening analysis was performed, the screening analysis was not redone because the overall results did not change and the additional information was fully captured in the final emission calculations presented in Section 4.7of the EIS.

References

California Air Resources Board (ARB). 2006. EMFAC2007 (Version 2.3). November.

This page is intentionally left blank.

Attachment 1

This page is intentionally left blank.

ATTACHMENT 1-1

Summary of Hauling Routes

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

Shaded cells indicate that a General Conformity analysis is not necessary since the county is in attainment for all pollutants.

Italicized, bold cells indicate that the route presents the worst-case scenario for hauling.

The General Conformity analysis will be a hybrid of routes, using the maximum distance traveled in each county to identify the maximum number of trucks.

State or California Air Basin			South Central Coast	South Coast		Mojave Desert	San Joaquin Valley		Great Basin Valleys	Nevada					Utah
Landfill	**Location**	**Total Roundtrip Distance (miles)**	**Roundtrip Distance (miles) per County**												
			Ventura	**Los Angeles**	**San Bernardino**		**Kern**	**Kings**	**Inyo**	**Nye**	**Clark**	**Lincoln**	**White Pine**	**Elko**	**Tooele**
Kettleman Hills	Kettleman City, California	335	1	126			***170***	***38***							
Buttonwillow	Buttonwillow, California	252	1	126			125								
U.S. Ecology	Beatty, Nevada	828	1	144.2	88.8	277.8			98	69.4					
Antelope Valley	Lancaster, California	141	1	140											
Energy Solutions	Clive, Utah	1,428	***1***	***144.2***	***88.8***	***328.6***				78	***178***	200	***226***	112	***108***
Pollutant			**County Attainment Status**												
Ozone [a]			Serious N [b]	Extreme N [c]	Extreme N [d]	Moderate N [d]	Extreme N [e]	Extreme N [e]	A	A	Former Subpart I [i]	A	A	A	A
PM_{10}			A	Serious N [c]	Serious N [d]	Moderate N [d]	Serious N	M	A [h]	A	Serious N [i]	A	A	A	A
$PM_{2.5}$ (Direct Emissions)			A	N [c]	N [d]	A [d]	N [f]	N	A	A	A	A	A	A	A [j]
CO			A	Serious M [c]	Serious M [d]	A [d]	A [g]	A	A	A	Serious M [i]	A	A	A	A
NO_2			A	A	A	A	A	A	A	A	A	A	A	A	A
SO_2			A	A [c]	A	A	A	A	A	A	A	A	M	A	N [k]
Lead (2008 standard)			A	N [c]	A	A	A	A	A	A	A	A	A	A	A

Notes:

A = Attainment

M = Maintenance

N = Nonattainment

[a] These area designations are based on the 8-hour ozone standard. The 1-hour ozone standard no longer applies to the counties in nonattainment areas per the anti-backsliding provisions of 40 CFR 51.905(a)(3) and (4). The anti-backsliding provisions apply to areas that are designated attainment for the 8-hour ozone standard and were, at the time of the 8-hour designations, either attainment areas with maintenance plans for the 1-hour standard or nonattainment for the 1-hour standard. Specifically, the anti-backsliding provisions require these areas to submit a maintenance plan under section 110(a)(1) of the CAA. The counties in attainment for the 8-hour ozone standard were also in attainment for the 1-hour ozone standard and were not required to submit maintenance plans at the time of 8-hour designations.

[b] Ventura County has partial serious nonattainment for the 8-hour ozone standard. The portion of the project occurring within Ventura County will occur in the nonattainment portion.

[c] The portion of Los Angeles County located within the SCAB has extreme nonattainment for the 8-hour ozone standard, serious nonattainment for PM_{10}, nonattainment for $PM_{2.5}$, serious maintenance for CO, and nonattainment for the 2008 lead standard. The portion of the project occurring within Los Angeles County will occur in the SCAB and, therefore, in the nonattainment or maintenance areas for these pollutants.

[d] The portion of San Bernardino County located in the SCAB has extreme nonattainment for the 8-hour ozone standard, serious nonattainment for PM_{10}, nonattainment for $PM_{2.5}$, and maintenance for CO whereas the portion located in the MDAB has moderate nonattainment for the 8-hour ozone standard and PM_{10} and attainment for $PM_{2.5}$ and CO. The project will occur in both of these portions of San Bernardino County.

[e] Kern and Kings counties each have partial extreme nonattainment for the 8-hour ozone standard. The portion of the project occurring within Kern and Kings counties will occur in the nonattainment portions.

[f] Kern County has partial nonattainment for $PM_{2.5}$. The portion of the project occurring within Kern County will occur in the nonattainment portion.

[g] The metropolitan area of Bakersfield, located within Kern County, has partial maintenance for CO. The portion of the project occurring within Kern County will not occur within this metropolitan area and is, therefore, in attainment.

[h] Inyo County has PM_{10} nonattainment and maintenance for two specific areas: Owens Valley and Coso Junction, respectively. The portion of the project occurring within Inyo County would occur at least 100 miles from these areas.

[i] Clark County has partial Former Subpart 1 status for the 8-hour ozone standard, serious nonattainment for PM_{10}, and serious maintenance for CO. The portion of the project occurring within Clark County would occur in the nonattainment and maintenance portions for these pollutants.

[j] Tooele County has partial nonattainment for $PM_{2.5}$. The portion of the project occurring within Tooele County would not occur in this nonattainment portion.

[k] Tooele County has partial nonattainment for SO_2. Based on the available data, the portion of the project occurring within Tooele County may or may not occur in the nonattainment portion. As a conservative approach, it was assumed that the project would occur in the nonattainment portion.

ATTACHMENT 1-2
General Conformity *De Minimis* Threshold Values
NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:
The General Conformity *de minimis* threshold values are presented only for the counties which will be evaluated in the General Conformity analysis, as described on the Haul Route Summary tab.

State or California Air Basin	South Central Coast		South Coast				Mojave Desert		San Joaquin Valley				Nevada				Utah	
Pollutant	County Attainment Status / General Conformity *De Minimis* Threshold Values (tons/year) [a, b]																	
	Ventura		Los Angeles		San Bernardino				Kern		Kings		Clark		White Pine		Tooele	
Ozone	Serious N	50	Extreme N	10	Extreme N	10	Moderate N [c]	100	Extreme N	10	Extreme N	10	Former Subpart I [d]	100	A	N/A	A	N/A
Ozone Precursor (NOx)	Serious N	50	Extreme N	10	Extreme N	10	Moderate N [c]	100	Extreme N	10	Extreme N	10	Former Subpart I [d]	100	A	N/A	A	N/A
Ozone Precursor (VOC)	Serious N	50	Extreme N	10	Extreme N	10	Moderate N [c]	100	Extreme N	10	Extreme N	10	Former Subpart I [d]	100	A	N/A	A	N/A
PM_{10}	A	N/A	Serious N	70	Serious N	70	Moderate N	100	Serious N	70	M	100	Serious N	70	A	N/A	A	N/A
$PM_{2.5}$ (Direct Emissions)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
$PM_{2.5}$ Precursor (SO_2)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
$PM_{2.5}$ Precursor (NOx)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
$PM_{2.5}$ Precursor (VOC)	A	N/A	N	100	N	100	A	N/A	N	100	N	100	A	N/A	A	N/A	A	N/A
CO	A	N/A	Serious M	100	Serious M	100	A	N/A	A	N/A	A	N/A	Serious M	100	A	N/A	A	N/A
NO_2	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A
SO_2	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	M	100	N	100
Lead (2008 standard)	A	N/A	N	25	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A	A	N/A

Notes:
A = Attainment
M = Maintenance
N = Nonattainment
N/A = Not Applicable

[a] General Conformity *de minimis* threshold values from 40 CFR Parts 51 and 93, EPA-HQ-OAR-2004-0491; FRL-8197-4.

[b] Refer to the notes on the 'Haul Route Summary' tab for details on which counties are in partial nonattainment, maintenance, or attainment areas.

[c] California is not located in an ozone transportation region (http://www.epa.gov/glo/fs20080317.html). As a result, the General Conformity *de minimis* threshold value for an ozone attainment status of "Moderate Nonattainment" was taken as 100 tons/year.

[d] Per 76 FR 17373, the designation status of the Clark County ozone nonattainment area remains nonattainment despite the EPA's determination that the area has attained the National Ambient Air Quality Standard. Since Clark County is not located in an ozone transportation region, the General Conformity *de minimis* threshold value of 100 tons/year was used.

ATTACHMENT 1-3

Truck Trip Analysis for the Maximum Distance Traveled in Ventura County (SCCAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	50	N/A	50	N/A	N/A	N/A	N/A
Haul Year 2016							
Constant Emissions (tons/year) [a]	2	8	12	0	1,051	219	0
Road Repair Emissions (tons/year) [b]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [c]	107,110,154	N/A	5,710,958	N/A	N/A	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [d]	107,110,154	N/A	5,710,958	N/A	N/A	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [e]	2,035,092,931	N/A	108,508,207	N/A	N/A	N/A	N/A
Haul Year 2017							
Constant Emissions (tons/year) [a]	2	9	12	0	1,146	239	0
Road Repair Emissions (tons/year) [b]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [c]	118,322,075	N/A	6,446,721	N/A	N/A	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [d]	118,322,075	N/A	6,446,721	N/A	N/A	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [e]	2,248,119,420	N/A	122,487,699	N/A	N/A	N/A	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	4,283,212,350	N/A	230,995,906	N/A	N/A	N/A	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] Constant emissions are a result of onsite construction activities and worker commutes.

[b] Road repair emissions occur only in conjunction with material hauling activities.

[c] Conversion factor: 1 short ton: 907,185 grams

[d] Distance Traveled per Roundtrip: 1 VMT/trip

[e] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.409	3.191	5.884	0.016	0.330	0.267	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.370	2.909	5.220	0.016	0.306	0.245	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-4

Truck Trip Analysis for the Maximum Distance Traveled in Los Angeles County (SCAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	10	100	10	100	70	100	25
Haul Year 2016							
Constant Emissions (tons/year) [a]	0	0	0	0	0	0	0
Road Repair Emissions (tons/year) [b]	0	0	1	0	0	0	0
Annual VMT Allowable (miles/year) [c]	20,433,707	31,528,535	1,333,139	5,669,830,894	170,590,538	298,187,427	36,529,426,931
Annual Truck Trips Allowed (trucks/year) [d]	141,704	218,644	9,245	39,319,216	1,183,013	2,067,874	253,324,736
Annual Material Hauled in Allowable Truck Trips (cy/year) [e]	2,692,375	4,154,245	175,656	747,065,097	22,477,255	39,289,606	4,813,169,984
Haul Year 2017							
Constant Emissions (tons/year) [a]	0	0	0	0	0	0	0
Road Repair Emissions (tons/year) [b]	0	0	1	0	0	0	0
Annual VMT Allowable (miles/year) [c]	22,830,087	34,210,493	1,524,788	5,669,828,670	186,150,379	329,640,709	36,529,424,796
Annual Truck Trips Allowed (trucks/year) [d]	158,322	237,243	10,574	39,319,200	1,290,918	2,285,997	253,324,721
Annual Material Hauled in Allowable Truck Trips (cy/year) [e]	3,008,125	4,507,624	200,908	747,064,804	24,527,442	43,433,935	4,813,169,703
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	5,700,500	8,661,869	376,565	1,494,129,901	47,004,698	82,723,541	9,626,339,687
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	No						
Duration Required to Complete Hauling (Years)	2.67						

Notes:

[a] Constant emissions are a result of worker commutes.

[b] Road repair emissions occur only in conjunction with material hauling activities and occur along onsite and offsite roads.

[c] Conversion factor: 1 short ton: 907,185 grams

[d] Distance Traveled per Roundtrip: 144 VMT/trip

[e] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.440	2.861	6.382	0.016	0.371	0.304	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.394	2.637	5.605	0.016	0.340	0.275	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-5

Truck Trip Analysis for the Minimum Distance Traveled in Los Angeles County (SCAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the minimum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	10	100	10	100	70	100	25
Haul Year 2016							
Constant Emissions (tons/year) [a]	0	0	0	0	0	0	0
Road Repair Emissions (tons/year) [b]	0	0	1	0	0	0	0
Annual VMT Allowable (miles/year) [c]	20,433,707	31,528,535	1,333,139	5,669,830,894	170,590,538	298,187,427	36,529,426,931
Annual Truck Trips Allowed (trucks/year) [d]	162,172	250,226	10,580	44,998,658	1,353,893	2,366,567	289,916,087
Annual Material Hauled in Allowable Truck Trips (cy/year) [e]	3,081,273	4,754,303	201,029	854,974,500	25,723,970	44,964,771	5,508,405,648
Haul Year 2017							
Constant Emissions (tons/year) [a]	0	0	0	0	0	0	0
Road Repair Emissions (tons/year) [b]	0	0	1	0	0	0	0
Annual VMT Allowable (miles/year) [c]	22,830,087	34,210,493	1,524,788	5,669,828,670	186,150,379	329,640,709	36,529,424,796
Annual Truck Trips Allowed (trucks/year) [d]	181,191	271,512	12,101	44,998,640	1,477,384	2,616,196	289,916,070
Annual Material Hauled in Allowable Truck Trips (cy/year) [e]	3,442,632	5,158,725	229,928	854,974,165	28,070,295	49,707,726	5,508,405,326
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	6,523,905	9,913,028	430,957	1,709,948,664	53,794,265	94,672,497	11,016,810,975
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	No						
Duration Required to Complete Hauling (Years)	2.33						

Notes:

[a] Constant emissions are a result of worker commutes.

[b] Road repair emissions occur only in conjunction with material hauling activities and occur along onsite and offsite roads.

[c] Conversion factor: 1 short ton: 907,185 grams

[d] Distance Traveled per Roundtrip: 126 VMT/trip

[e] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.440	2.861	6.382	0.016	0.371	0.304	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.394	2.637	5.605	0.016	0.340	0.275	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-6

Truck Trip Analysis for the Maximum Distance Traveled in San Bernardino County (SCAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	10	100	10	100	70	100	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	20,617,834	31,708,658	1,421,474	5,669,904,375	171,166,925	298,416,020	N/A
Annual Truck Trips Allowed (trucks/year) [c]	232,183	357,079	16,008	63,850,274	1,927,555	3,360,541	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	4,411,474	6,784,510	304,144	1,213,155,215	36,623,554	63,850,274	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	23,024,992	34,402,150	1,618,528	5,669,904,375	186,773,321	329,885,345	N/A
Annual Truck Trips Allowed (trucks/year) [c]	259,290	387,412	18,227	63,850,274	2,103,303	3,714,925	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	4,926,519	7,360,820	346,307	1,213,155,215	39,962,760	70,583,576	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	9,337,992	14,145,331	650,451	2,426,310,431	76,586,314	134,433,851	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in San Bernardino County. Additionally, road repair activities will not occur in San Bernardino County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 89 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.440	2.861	6.382	0.016	0.371	0.304	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.394	2.637	5.605	0.016	0.340	0.275	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-7

Truck Trip Analysis for the Maximum Distance Traveled in San Bernardino County (MDAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	100	N/A	100	N/A	100	N/A	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	237,482,906	N/A	15,157,639	N/A	261,436,513	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	722,711	N/A	46,128	N/A	795,607	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	13,731,513	N/A	876,431	N/A	15,116,536	N/A	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	264,485,335	N/A	17,329,221	N/A	286,178,139	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	804,885	N/A	52,737	N/A	870,901	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	15,292,822	N/A	1,001,994	N/A	16,547,123	N/A	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	29,024,335	N/A	1,878,425	N/A	31,663,659	N/A	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in San Bernardino County. Additionally, road repair activities will not occur in San Bernardino County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 329 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.382	2.300	5.985	0.016	0.347	0.281	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.343	2.175	5.235	0.016	0.317	0.254	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-8

Truck Trip Analysis for the Maximum Distance Traveled in Kern County (SJVAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	10	N/A	10	100	70	100	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	20,999,646	N/A	1,348,172	5,669,904,375	164,942,673	287,083,766	N/A
Annual Truck Trips Allowed (trucks/year) [c]	123,527	N/A	7,930	33,352,379	970,251	1,688,728	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	2,347,019	N/A	150,678	633,695,195	18,434,769	32,085,833	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	23,563,239	N/A	1,548,625	5,669,904,375	181,956,817	319,431,232	N/A
Annual Truck Trips Allowed (trucks/year) [c]	138,607	N/A	9,110	33,352,379	1,070,334	1,879,007	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	2,633,538	N/A	173,082	633,695,195	20,336,350	35,701,138	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	4,980,558	N/A	323,760	1,267,390,390	38,771,119	67,786,970	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	No						
Duration Required to Complete Hauling (Years)	3.10						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in Kern County. Additionally, road repair activities will not occur in Kern County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 170 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.432	2.492	6.729	0.016	0.385	0.316	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.385	2.331	5.858	0.016	0.349	0.284	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-9

Truck Trip Analysis for the Minimum Distance Traveled in Kern County (SJVAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the minimum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	10	N/A	10	100	70	100	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	20,999,646	N/A	1,348,172	5,669,904,375	164,942,673	287,083,766	N/A
Annual Truck Trips Allowed (trucks/year) [c]	167,997	N/A	10,785	45,359,235	1,319,541	2,296,670	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	3,191,946	N/A	204,922	861,825,465	25,071,286	43,636,732	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	23,563,239	N/A	1,548,625	5,669,904,375	181,956,817	319,431,232	N/A
Annual Truck Trips Allowed (trucks/year) [c]	188,506	N/A	12,389	45,359,235	1,455,655	2,555,450	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	3,581,612	N/A	235,391	861,825,465	27,657,436	48,553,547	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	6,773,558	N/A	440,313	1,723,650,930	52,728,722	92,190,280	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	No						
Duration Required to Complete Hauling (Years)	2.28						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in Kern County. Additionally, road repair activities will not occur in Kern County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 125 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.432	2.492	6.729	0.016	0.385	0.316	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.385	2.331	5.858	0.016	0.349	0.284	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-10

Truck Trip Analysis for the Maximum Distance Traveled in Kings County (SJVAB)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	10	N/A	10	100	100	100	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	20,999,646	N/A	1,348,172	5,669,904,375	235,632,390	287,083,766	N/A
Annual Truck Trips Allowed (trucks/year) [c]	552,622	N/A	35,478	149,208,010	6,200,852	7,554,836	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	10,499,823	N/A	674,086	2,834,952,188	117,816,195	143,541,883	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	23,563,239	N/A	1,548,625	5,669,904,375	259,938,309	319,431,232	N/A
Annual Truck Trips Allowed (trucks/year) [c]	620,085	N/A	40,753	149,208,010	6,840,482	8,406,085	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	11,781,619	N/A	774,313	2,834,952,188	129,969,155	159,715,616	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	22,281,442	N/A	1,448,398	5,669,904,375	247,785,350	303,257,499	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in Kings County. Additionally, road repair activities will not occur in Kings County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 38 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.432	2.492	6.729	0.016	0.385	0.316	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.385	2.331	5.858	0.016	0.349	0.284	0.001

Notes:

[a] Unless otherwise noted, emission factors are from EMFAC2007, assuming a temperature of 70°F and a relative humidity of 60%.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-11

Truck Trip Analysis for the Maximum Distance Traveled in Clark County (Nevada)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	100	100	100	N/A	70	N/A	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	206,178,341	28,429,480	13,481,716	N/A	164,942,673	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	1,158,305	159,716	75,740	N/A	926,644	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	22,007,800	3,034,607	1,439,060	N/A	17,606,240	N/A	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	230,249,924	31,185,449	15,486,253	N/A	181,956,817	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	1,293,539	175,199	87,001	N/A	1,022,229	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	24,577,239	3,328,784	1,653,027	N/A	19,422,357	N/A	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	46,585,039	6,363,391	3,092,087	N/A	37,028,597	N/A	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in Clark County. Additionally, road repair activities will not occur in Clark County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 178 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.440	3.191	6.729	0.016	0.385	0.316	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.394	2.909	5.858	0.016	0.349	0.284	0.001

Notes:

[a] As a conservative estimate, the maximum California emission factors were assumed representative of Clark County.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-12

Truck Trip Analysis for the Maximum Distance Traveled in White Pine County (Nevada)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	N/A	N/A	N/A	100	N/A	N/A	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	N/A	N/A	N/A	5,669,904,375	N/A	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	N/A	N/A	N/A	25,088,072	N/A	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	N/A	N/A	N/A	476,673,377	N/A	N/A	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	N/A	N/A	N/A	5,669,904,375	N/A	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	N/A	N/A	N/A	25,088,072	N/A	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	N/A	N/A	N/A	476,673,377	N/A	N/A	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	N/A	N/A	N/A	953,346,753	N/A	N/A	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in White Pine County. Additionally, road repair activities will not occur in White Pine County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 226 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.440	3.191	6.729	0.016	0.385	0.316	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.394	2.909	5.858	0.016	0.349	0.284	0.001

Notes:

[a] As a conservative estimate, the maximum California emission factors were assumed representative of White Pine County.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

ATTACHMENT 1-13

Truck Trip Analysis for the Maximum Distance Traveled in Tooele County (Utah)

NASA SSFL EIS - Air Quality General Conformity Analysis

Introduction:

This tab identifies whether the 2017 deadline can be met based on the county's General Conformity *de minimis* threshold values, the project emissions occurring regardless of hauling activities, and the maximum possible mileage traveled within the county.

Truck Trip Analysis

Pollutant	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	Pb
General Conformity *De Minimis* Threshold (tons/year)	N/A	N/A	N/A	100	N/A	N/A	N/A
Haul Year 2016							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	N/A	N/A	N/A	5,669,904,375	N/A	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	N/A	N/A	N/A	52,499,115	N/A	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	N/A	N/A	N/A	997,483,177	N/A	N/A	N/A
Haul Year 2017							
Constant and Road Repair Emissions (tons/year) [a]	0	0	0	0	0	0	0
Annual VMT Allowable (miles/year) [b]	N/A	N/A	N/A	5,669,904,375	N/A	N/A	N/A
Annual Truck Trips Allowed (trucks/year) [c]	N/A	N/A	N/A	52,499,115	N/A	N/A	N/A
Annual Material Hauled in Allowable Truck Trips (cy/year) [d]	N/A	N/A	N/A	997,483,177	N/A	N/A	N/A
Summary							
Total Material Hauled in Allowable Truck Trips (cy/project)	N/A	N/A	N/A	1,994,966,354	N/A	N/A	N/A
Soil Volume to be Removed from SSFL (cy/project)	502,381						
Is the 2017 Deadline Met (Yes/No)?	Yes						

Notes:

[a] There are no constant, non-hauling emissions expected to occur in Tooele County. Additionally, road repair activities will not occur in Tooele County.

[b] Conversion factor: 1 short ton: 907,185 grams

[c] Distance Traveled per Roundtrip: 108 VMT/trip

[d] Truck Capacity: 19 cy/truck

Vehicle Emission Factors

Vehicle Type	Emission Factors (g/mile) [a]						
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	Pb [c]
2016 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.440	3.191	6.729	0.016	0.385	0.316	0.001
2017 Offsite Emission Factors (55 mph)							
Heavy-Heavy Duty Trucks [d]	0.394	2.909	5.858	0.016	0.349	0.284	0.001

Notes:

[a] As a conservative estimate, the maximum California emission factors were assumed representative of Tooele County.

[b] PM_{10} and $PM_{2.5}$ emission factors account for particulate emissions from running exhaust, tire wear, and break wear.

[c] A lead emission factor for stationary and portable internal combustion engines was assumed representative of on-road vehicles. This factor was obtained from Table B-2 of the *Supplemental Instructions: Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory* (SCAQMD, 2010). Due to limited available data, this emission factor was assumed equal for all vehicle speeds and all construction years: 0.0083 lbs/1,000 gallons

[d] As calculated using EMFAC2007 (per note a), the heavy-heavy duty truck (diesel) fuel economy is: 6.064 miles per gallon

End of Appendix I

APPENDIX J

Santa Susana Field Laboratory–Paleontological Resources Assessment

This page intentionally left blank.

APPENDIX J

Santa Susana Field Laboratory–Paleontological Resources Assessment

PREPARED FOR: Amy Keith/NASA
Allen Elliott/NASA

PREPARED BY: James Verhoff/CH2M HILL
Geof Spaulding/CH2M HILL

COPIES: Beth Vaughan/CH2M HILL
Leslie Tice/CH2M HILL

DATE: November 30, 2011

Introduction

The purpose of this technical memorandum is to evaluate the potential for encountering paleontological resources (more commonly known as fossils) and to identify the potential impacts to paleontological resources that could result from the National Aeronautic and Space Administration's (NASA's) proposal to demolish structures and conduct soil and groundwater remediation on the NASA-administered property at the Santa Susana Field Laboratory (SSFL). For the purpose of this analysis, the NASA-administered property of SSFL is termed the "study area," as portrayed in Figure 1.

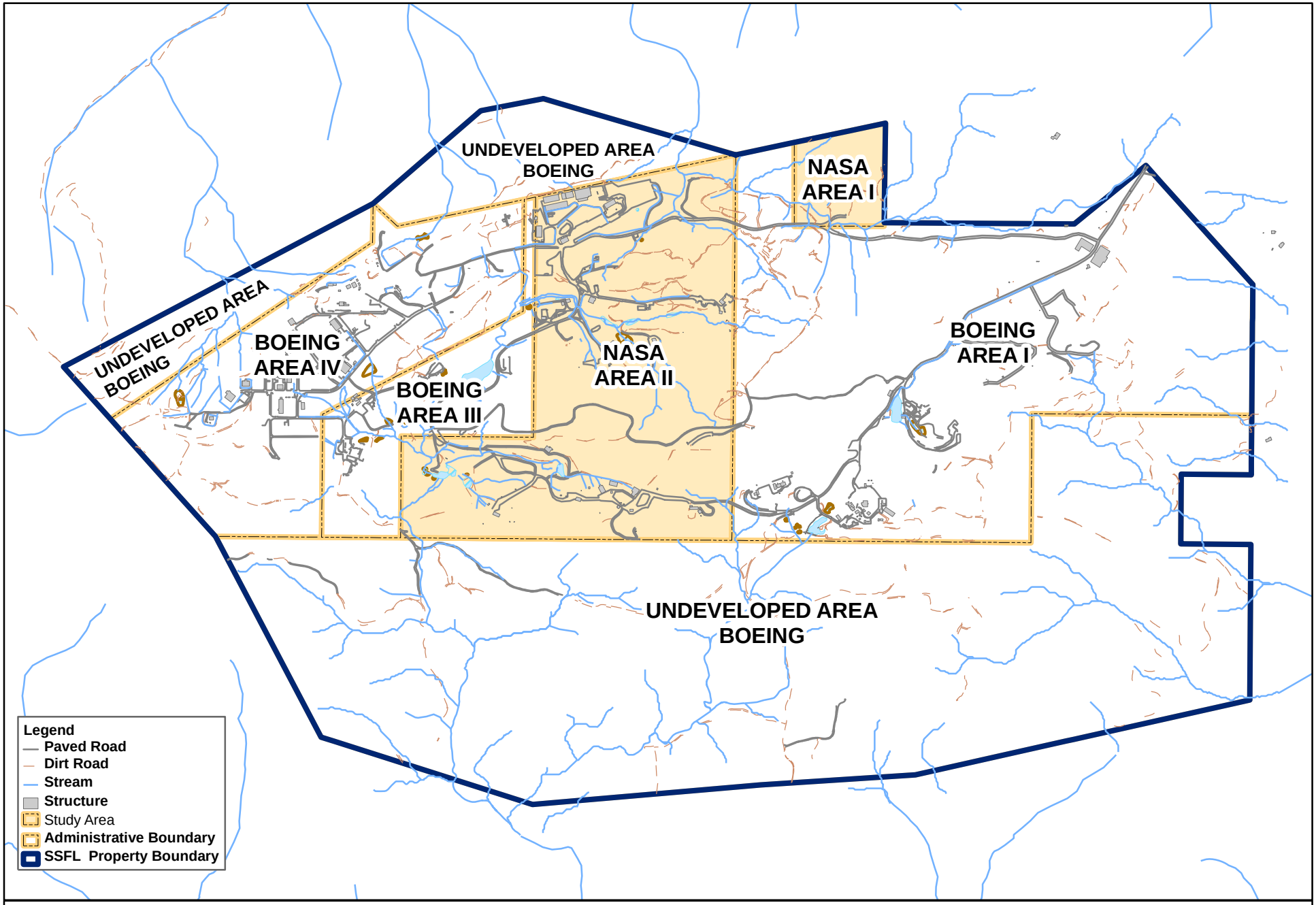
This study was prepared in conjunction with the federal Environmental Impact Statement (EIS). NASA is considering the following in its EIS:

- Up to 100-percent demolition of structures located on the NASA-administered portion of SSFL
- Soil remediation across the site by applying one or more remedial technologies including excavation, ex-situ treatments (which require excavation, treatment, and replacement of treated soils), soil vapor extraction, in-situ treatments (which include installing wells and injecting chemical, biological, or thermal treatments), phytoremediation, monitored natural attenuation, or institutional controls
- Groundwater treatment across the site by installing wells and applying one or more remedial technologies including pump and treat, vacuum extraction, iron-particle injection, thermal extraction, in-situ chemical or biological treatments, monitored natural attenuation, or institutional controls

Figures 2a and 2b identify the areas in which soil and groundwater remediation activities could take place. This assessment considers the potential to encounter paleontological resources as a result of the implementation of these proposed actions.

Although this assessment was conducted to support the EIS, other activities such as characterization of contamination and site operations also potentially could encounter or adversely affect paleontological resources. These activities are outside the scope of the EIS, but will be considered in the overall assessment.

This study included a literature search, which included reviewing available geologic maps, scientific publications, and technical reports for SSFL. A review of available museum and database records also was conducted. This study was conducted in compliance with professional guidelines and legislation relevant to paleontological resources management and mitigation, discussed in Section 3.



Map Document: O:\NASA\SSFL\maps\EIS_2011\PRA_Regional.mxd

Figure 1
Regional Map
NASA - Santa Susana Field Laboratory
Paleontological Resources Assessment

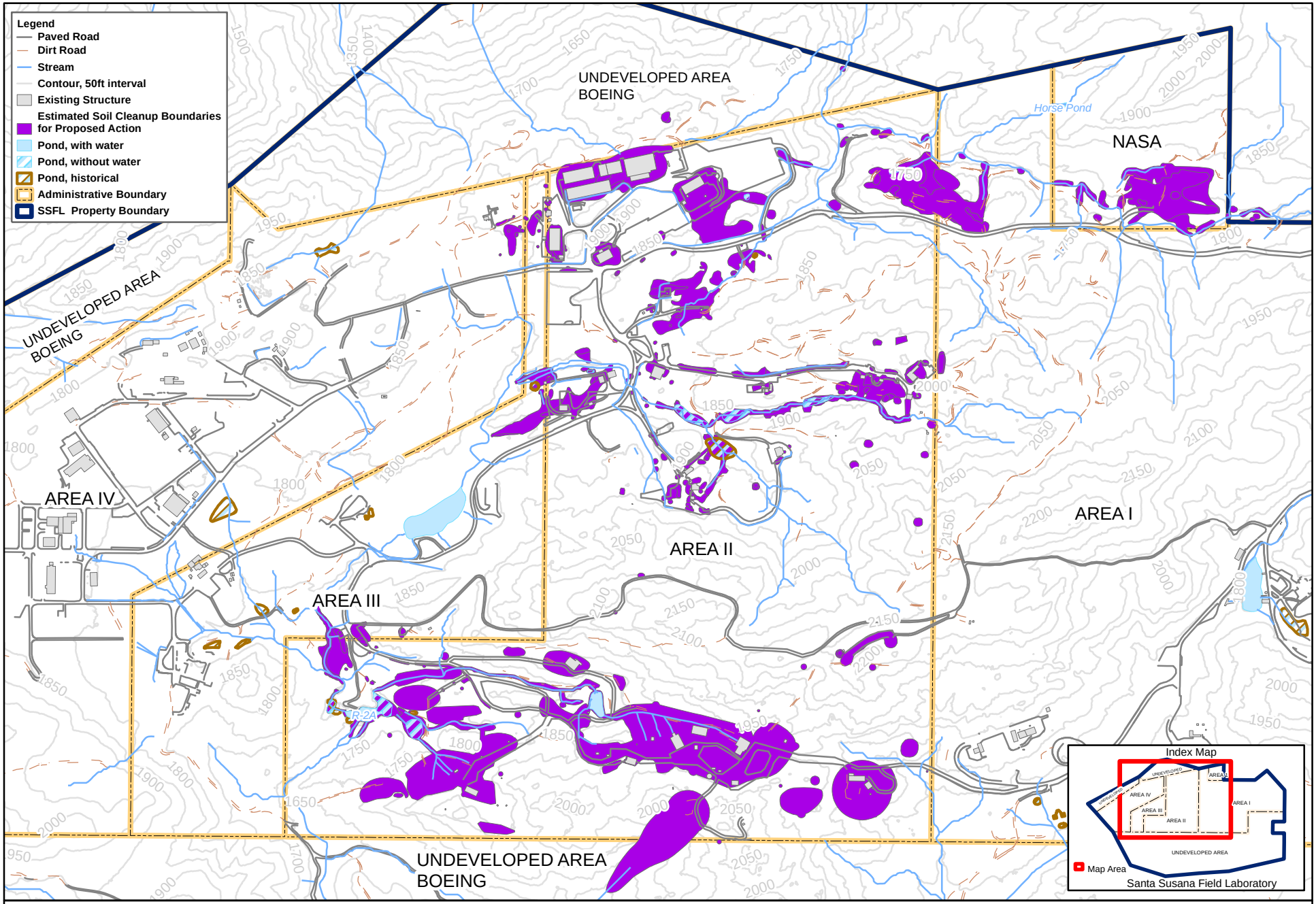


Figure 2A
Proposed Soil Remediation Area Under the Proposed Action
NASA - Santa Susana Field Laboratory
Paleontological Resources Assessment

Map Document: O:\NASA\SSFL\maps\EIS_2011\PRA_ProposedCleanup.mxd

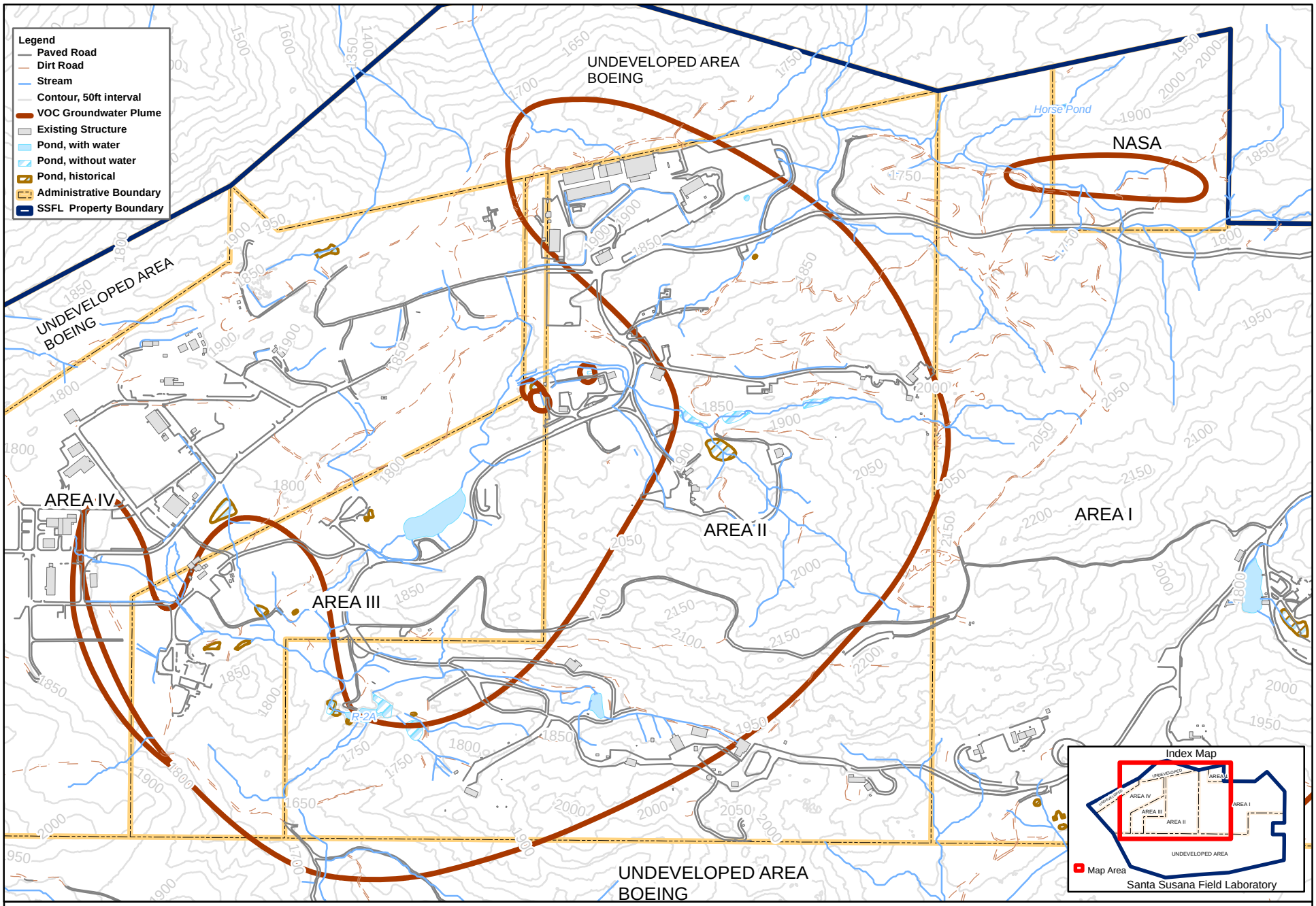


Figure 2B
Proposed Groundwater Remediation Area Under All Action Alternatives
NASA - Santa Susana Field Laboratory
Paleontological Resources Assessment

Map Document: O:\NASA\SSFL\maps\EIS_2011\PRA_GroundwaterRemediation.mxd

The environmental setting, including a discussion of the geologic setting, is presented in Section 2. A description of the laws, ordinances, regulations, and standards applicable to paleontological resources is presented in Section 3. Section 4 provides a discussion of the project impacts and associated mitigation measures. References are provided in Section 5.

Environmental Setting

SSFL consists of approximately 2,850 acres of hilly terrain approximately 29 miles northwest of downtown Los Angeles, California, and immediately southeast of Simi Valley, on the southeastern corner of Ventura County, California. The site is at approximately 2,100 feet of elevation with more than 1,000 feet of topographic relief within the study area.

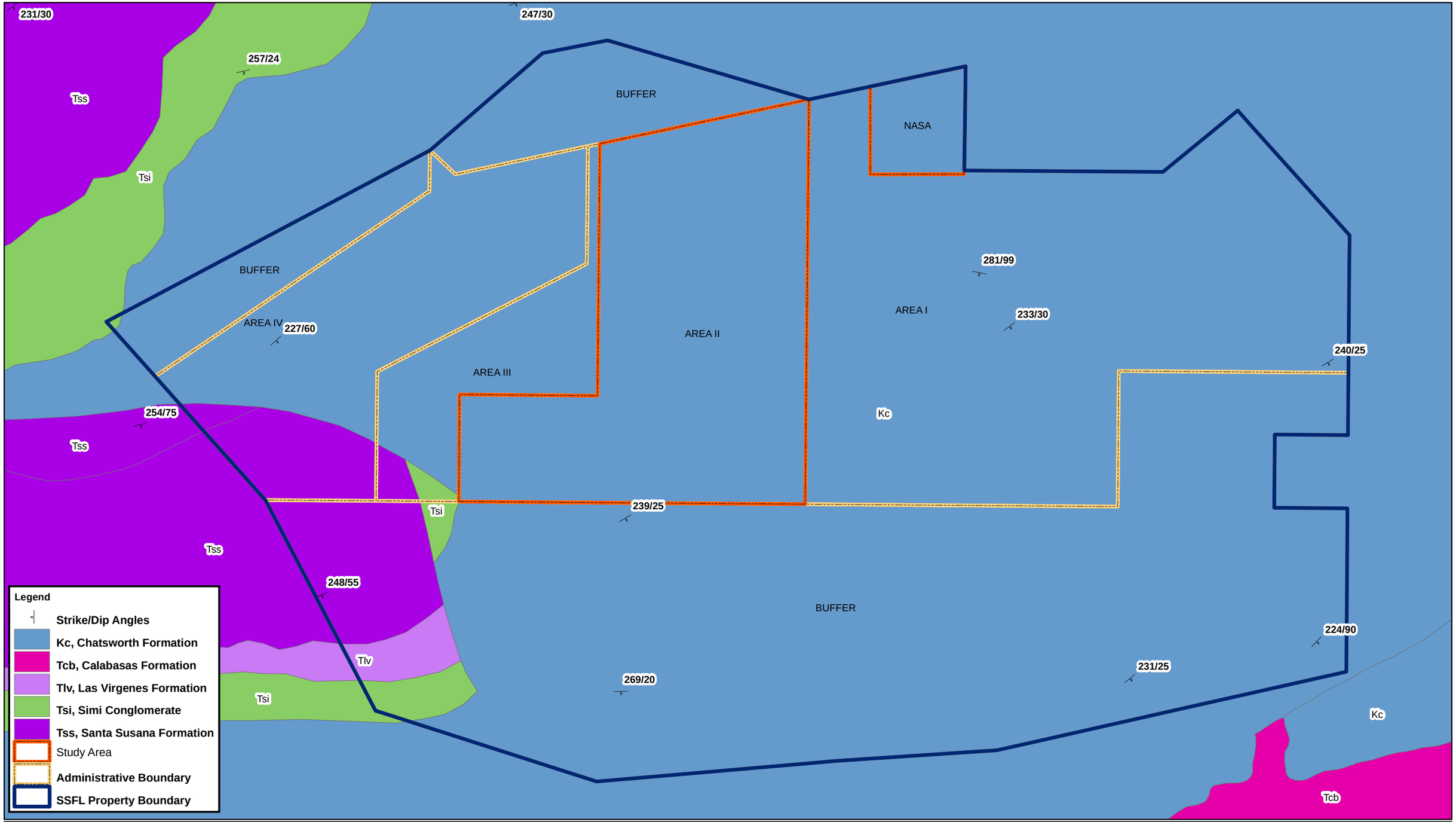
Regional Geology

SSFL is situated in the Transverse Ranges, a geomorphic province dominated by rugged, mountainous terrain. The geologic structures of the Transverse Ranges, including the province itself, run predominantly east-west because of north-south compression from the numerous faults in the region, predominantly the San Andreas Fault Zone (MWH, 2007). The Transverse Ranges themselves are largely granitic, but sedimentary rocks also are preserved in certain areas, particularly on the flanks of the uplifts. As might be expected from its proximity to the Pacific Ocean, the sedimentary formations of the region preserve a predominantly marine history, with several non-marine episodes, and have produced a nearly continuous record from the Late Cretaceous to the Quaternary (MWH, 2009). Since the Early Miocene the region has undergone several episodes of intense deformation, including rotation of the entire region, which continues today (Nicholson et al., 1994), and later rifting (MWH, 2009). Together, these tectonic events create a complex regional geology that includes numerous large folds and faults as ever more Pacific Ocean sediment is accreted to the western edge of North America.

Local Geology

Figure 3 shows the geological units within this rugged area. In general, the local geology of an area establishes the potential to encounter paleontological resources within that area. The geologic unit that underlies the entire study area is the Cretaceous Chatsworth Formation (Kew, 1924; MWH, 2007), which is now defined as encompassing the fine-grained marine sandstones of the Late Cretaceous in the Simi Hills that had previously been considered part of the Chico Formation (Colburn et al., 1981a; Kew, 1924). The Chatsworth Formation is bounded at the top by an angular unconformity, which forms the contact with the overlying Simi Conglomerate; the bottom contact of the unit is not exposed (Colburn et al., 1981a; MWH, 2007; MWH, 2009), but seismic data suggest that the formation unconformably overlies continental basement rock (Colburn, 1981b). In the study area, the formation generally dips to the northwest and is deformed by numerous faults and folds (Kew, 1924; Colburn et al., 1981a).The formation is interpreted to be a preserved submarine fan, composed primarily of turbidite sandstones and interbedded mudstone (Colburn et al., 1981a). For the purposes of this report, the Chatsworth Formation has been divided into a lower member, which is exposed at the southeastern corner of the site and generally dips northeast to underlie the site at unknown, but presumably great, depths; and an upper member, which dominates the surface geology of the site and forms the dramatic cliffs in the area. More recent work (MWH, 2007; MWH, 2009) has subdivided the upper portion of the Chatsworth Formation into numerous members, based generally on grain size and bed thickness, and provides detailed stratigraphic analysis of the upper member of the formation. The division between the upper and lower members of the Chatsworth Formation is based on the percentages of fine-grained to coarse-grained beds visible in outcrops, although the lithology of both members is similar and both include beds ranging from coarse sandstone to shale (MWH, 2007). In satellite imagery the upper member of the Chatsworth Formation is identifiable by the more rugged topography, which includes numerous cliffs and shear faces. In contrast, the lower member of the Chatsworth Formation, which is exposed in only a small portion of the southeastern corner of the study area, has produced a relatively less rugged topography with fewer outcrops and cliff faces.

The predominant sedimentary structures throughout the Chatsworth Formation, both upper and lower member, are turbidites (Colburn et al., 1981a). These, along with a sparse and re-worked local fauna (Colburn et al., 1981a) and numerous soft-sediment deformation structures (MWH, 2007), indicate that this formation was deposited in a



28-Nov-2011
Drawn By:
A. Cooley

Figure 3
Regional Geologic Units
NASA - Santa Susana Field Laboratory
Paleontological Resources Assessment

Map Document: O:\NASA\SSFL\maps\EIS_2011\PRA_Paleo.mxd

submarine fan environment. Submarine fans are broad, conical structures that form at the mouths of submarine canyons (canyons that form on the continental slopes), as shown in Link et al. (1981). This deposition has resulted in a geologic unit that generally is composed of laterally discontinuous beds. Turbidite deposits within these fans usually consist of sandstone and siltstone layers, decreasing in both grain size and bed thickness up-section, and typically are channelized and of limited geographic extent (Link, 1981). In places, part or all of the fine-grained portions of the turbidite sequence might have been stripped from the deposit by the processes that formed subsequent turbidite deposits, resulting in thick layers of sandstone with little to no shale between depositional beds (Link et al., 1981). Conglomerates and coquina-like shell deposits, such as those found in Dayton and Bell Canyons, are located in the lowest portions of the turbidite sequences (Link et al., 1981).

The only other units within the study area are quaternary alluvium, which consists of thin layers (typically 5 feet thick or less) of material eroded from the Chatsworth Formation scattered throughout the site (MWH, 2007); and disturbed fill from historic construction activities.

Younger sedimentary formations lie to the northwest and southeast of the study area. These include the Simi Conglomerate, the Las Virgenes Formation, the Santa Susana Formation, and the Calabasas Formation. In particular, the marine Santa Susana Formation lies immediately west of the southwestern study area boundary (Figure 3). This formation, however, is separated from the study area by a fault (MWH, 2007) and is not known to underlie any portion of the study area. These formations will not be affected adversely by the proposed demolition and remediation activities, and therefore, are not considered further.

Paleontological Records Search Results

A part of the assessment includes the review of available geologic maps, scientific publications, technical reports, and other references to identify geologic formations that would likely contain paleontological resources and to identify paleontological resources that have been previously identified by others neat the study area. The results of this review are discussed in this subsection.

Few references to fossils within the Chatsworth Formation are available. In large part, this might lack be due to the relative rarity of fossils within this unit. Megafossils (generally, fossils large enough to be seen in the field and without the aid of microscopes) are restricted to the lower member of the formation, and are rare within that member (Link et al., 1981). This lack of fossil records from the Chatsworth formation, in part, also could be because the formation name is relatively new (Link et al., 1981); therefore, fossils previously found in these beds would be attributed to other formations. The formation also was determined to have no potential to produce petroleum (Kew, 1924), which likely further reduced commercial interest in this formation.

To verify that the fossil record of the sediments underlying the study area was adequately addressed, the history of the sediments was reviewed, as were records of fossils found within the sediments before the adoption of the name “Chatsworth Formation.” Prior to 1981, the Cretaceous marine shales of the Simi Hills were described as being part of the Chico Formation (Link et al., 1981; Waring, 1917). No fossils were found in the overlying sandstone (what is now called the upper member of the Chatsworth Formation); however, invertebrate fossils, including gastropods, cephalopods, pelecypods (bivalves), echinoderms, and brittle stars were found in the shales now referred to as the lower member of the Chatsworth Formation (Waring, 1917). Later work (Kew, 1924) attributed both the shale-rich and overlying sandstone-rich units as part of the Chico Formation. The lithology of the fossil-bearing material also was defined more precisely–fossils were predominantly found in brown, calcite-rich, fine-grained sandstone at the base of the lower shale-rich unit (Kew, 1924). Kew (1924) confirms earlier reports that the upper sandstone units of Cretaceous age in this region are not fossiliferous.

More recently, field work in the Simi Hills area, and examination of museum records collected from beds now attributed to the Chatsworth Formation, have produced a sparse assemblage of invertebrate fossils including gastropods, cephalopods, and bivalves (Saul and Alderson, 1981), as well as trace fossils (Bottjer, 1981), from a small number of sites within the lower member of the formation. Although it has been estimated that more than 100 species of mollusks have been found, the majority have not yet been described (Saul and Alderson, 1981). The body fossils (fossils of the organism itself, as opposed to the trace fossils such as trackways and burrows) tend to be preserved in discrete packets of the rock (generally referred to as lenses due to their shape, which resembles a

convex lens) that represent the lowermost portions of channelized turbidite deposits within the lower member of the formation (Link, 1981). These fossil assemblages likely represent communities living at more shallow depths that were transported into the area by the turbidity currents that created this formation (Colburn et al., 1981a). Predominantly, these fossils have been found in the Dayton and Black Canyons (Saul and Alderson, 1981; Welton and Alderson, 1981; Waring, 1917), with the nearest lying 1.5 miles east of the study area (Link et al., 1981), within the lower member of the Chatsworth Formation.

The only vertebrate remains recorded from the Chatsworth Formation are shark teeth and fish bone found in two locations within the lower member of the formation, in association with large numbers of mollusk shells (Welton and Alderson, 1981). Few teeth are visible in hand-samples at either location; most of the fish remains were discovered by dissolution of rock from these locations in formic acid, which produced teeth, vertebrae, and placoid scales (Welton and Alderson, 1981).

Several microfossil sites (sites that have yielded fossils of microscopic organisms such as radiolaria, diatoms, and foraminifera) are located in the upper and lower members of the Chatsworth Formation. These include benthic foraminifera (Almgren, 1981) and calcareous nanofossils (Filewicz, 1981), which have contributed to identifying the age and depositional setting of the formation (Colburn et al., 1981a). Finally, plant fossils, including twigs and leaves, have been found in the fine-grained units within the Chatsworth Formation (Colburn et al., 1981a), although no details regarding the stratigraphic context of these fossils are available.

Along with the literature reviewed, two standard online databases (the PaleoBiology Database [not dated (n.d.)] and the University of California Museum of Paleontology [UCMP] database [n.d.]) were reviewed. The PaleoBiology Database (n.d.) records four gastropod species (*Perissitys colocara, P. pacifica, Murphitys Madonna,* and *M. corona*) from the formation. No information about the stratigraphy is provided (PaleoBiology Database, n.d.), and the study to which these records were attributed (Popenoe and Saul, 1987) does not provide a detailed stratigraphic analysis of these finds. The UCMP database (n.d.) does not include any records from the Chatsworth Formation Several records attributed to the Chico Formation within Ventura County in the UCMP database (UCMP, n.d.) are almost certainly references to outcrops now classified as the Chatsworth Formation; however, these references do not include faunal lists (UCMP, n.d.).

No fossils were attributed to the Quaternary alluvium at the site.

Because disturbed sediments, including disturbed native sediment and any non-native fill, have no potential to produce scientifically significant paleontological resources, these sediments were not included in the literature or records review.

Regulatory Setting

Potentially applicable federal, state, and local laws, ordinances, regulations, and standards governing the assessment and protection of paleontological resources are discussed in the following subsections.

Federal Regulations

Paleontological resources are protected by federal regulations, most of which apply only to excavations and construction on federal land. Because the project is on land owned by the federal government and administered by NASA, these federal laws, ordinances, regulations, and standards are applicable to the study area.

Paleontological resources were first protected by the Federal Antiquities Act of 1906 (Public Law [P.L.] 59-209; 16 United States Code [U.S.C.] 431 et seq.; 34 Stat. 225), which calls for the protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. Fossils, as prehistoric structures and objects of scientific interest, are therefore protected by this act.

Further federal protection of paleontological resources is provided by the Federal Land Management and Policy Act (43 U.S.C. 1712[c], 1732[b]); sec. 2, Federal Land Management and Policy Act of 1962 [30 U.S.C. 611]; Subpart 3631.0 et seq.), *Federal Register* Vol. 47, No. 159 (1982). This regulation charges federal agencies to manage public lands in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, archaeological, and water resources and, where appropriate, to preserve and protect certain

public lands in their natural conditions (Section 102[a][8][11]); to periodically inventory public lands so that the data can be used to make informed land-use decisions (Section 102[a][2]); and to regulate the use and development of public lands and resources through easements, licenses, and permits (Section 302[b]). Although paleontological resources are not mentioned specifically, scientifically significant fossils are understood to be scientific resources to be protected under this act.

The National Historic Preservation Act of 1966 includes more-specific regulations protecting paleontological resources. The statute provides for the survey, recovery, and preservation of significant paleontological data when such data could be destroyed or lost due to a federal, federally licensed, or federally funded project (P. L. 89 665; 80 Stat. 915, 16 U.S.C. 470 et seq.)

The *Code of Federal Regulations* Title 43, Section 8365.1-5 prohibits the collection of scientific resources, including vertebrate fossils, without a permit, as well as the use of fossils found on federal land for commercial purposes. However, the collection of reasonable amounts of common invertebrate fossils for non-commercial purposes is allowed.

State of California

The state of California has several regulations that protect paleontological resources, the most important being the California Environmental Quality Act (CEQA). However, because the study area is under federal jurisdiction, these regulations are not applicable to activities within the study area.

Ventura County

The Ventura County General Plan (County of Ventura, 2011) calls for an assessment of any potential impacts to paleontological resources for any discretionary project, and if impacts are expected either redesign of the project or mitigation of anticipated impacts. Because NASA is exempt from county regulations, the Ventura County General Plan is not applicable to activity within the study area.

Professional Standards and Guidelines

The Society of Vertebrate Paleontology (SVP), an international scientific organization of professional paleontologists, has established guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data recovery, specimen preparation, analysis, and curation (SVP, 1995). Most practicing professional paleontologists follow the SVP guidelines, with appropriate accommodations for the last 16 years of advancement in paleontological resources management. More recently, paleontological resource management guidelines were promulgated by the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM) *Instructional Memorandum 2008-009* (2008). These guidelines incorporate advancements that are being followed by many professional paleontologists conducting paleontological studies on federally managed land and elsewhere.

Environmental Impacts and Recommendations

The potential effects on paleontological resources from the proposed demolition and remediation activities within the study area are assessed in Section 4. These potential impacts consist of damage or destruction of fossils, or improper removal of fossils from the sediments in which they are found as a result of earth-moving activities including demolition, excavation, or well installation activities associated with the proposed actions. Because paleontological resources are non-renewable resources (SVP, 1995), all impacts to paleontological resources should be considered long-term impacts.

Sensitivity Criteria

In its guidelines for assessment and mitigation of adverse impacts to paleontological resources, the SVP (1995) established three categories of paleontological sensitivity for the geologic units–high, low, and undetermined. To these categories is added that of “moderate,” following current usage in federal guidelines (BLM, 2008). The paleontological importance or sensitivity of a geologic unit reflects its potential paleontological productivity as well as the scientific significance of the fossils it has produced. The potential paleontological productivity of a geologic unit exposed in the study area is inferred from the abundance of fossil specimens and/or previously recorded fossil

sites in exposures of the unit, or of similar units in similar geological settings. The underlying assumption of this assessment method is that a stratigraphic unit is most likely to yield fossil remains in a quantity and of a quality similar to those previously recorded from the unit elsewhere in the region.

An individual fossil specimen is considered scientifically important and therefore "significant" if it is identifiable; complete; well preserved; age diagnostic; useful in paleoenvironmental reconstruction; a member of a rare species; and/or a skeletal element different from, or a specimen more complete than, those now available for the species (SVP, 1995). For example, vertebrate remains are comparatively rare in the fossil record and most identifiable vertebrate remains, therefore, are scientifically significant. Invertebrate fossils, in contrast, are frequently part of a paleontologically significant fauna represented by many collections, but individually are of low scientific significance. That said, dense concentrations of invertebrate fossils can be considered scientifically significant due to the potential to catalog an entire, possibly diverse fauna, and the potential for finding rare taxa.

Significance Criteria

Federal and state statutes, as well as professional standards, agree that the damage or destruction of a unique paleontological resource or site is a significant and adverse impact to paleontological resources (for example, CEQA Section 3.1.2) (SVP, 1995; BLM, 2008). This type of damage most typically is thought of as occurring from heavy-equipment damage to fossils, but also might occur when fossils are looted, improperly removed from the surrounding sediment, or otherwise lost to the scientific world. Because fossils are a non-renewable resource (SVP, 1995), all impacts to paleontological resources are considered adverse and potentially significant unless they result in recovery of the scientific and educational values of the resource.

Generally, the probability of adverse impacts during excavations within a geologic unit is proportionate to the paleontological sensitivity of the unit in question. Although it is theoretically possible to adversely affect paleontological resources in low-sensitivity geologic units, the possibility would be remote. The highest probability of significant adverse effects to paleontological resources results from disturbance of stratigraphic units with high paleontological sensitivity. These are geological units that have produced scientifically significant fossils, and in which recorded fossil localities are sufficiently frequent to anticipate encountering more (SVP, 1995). Significant impacts are possible from excavation in moderate sensitivity units; however, such impacts are less likely than in high sensitivity units, because fossil sites in these units tend to be widely scattered or of low scientific significance (BLM, 2008).

Paleontological resources that remain undisturbed in the sediment are considered to be unaffected by the proposed demolition and remediation activities within the study area and are considered adequately protected. Because fossils will only be exposed during the earth-moving phases of the project (including any demolition, excavation, and well installation activities), operation of treatment systems and monitoring activities that would not result in subsurface disturbances usually have no potential to affect paleontological resources.

Sensitivity of Geologic Units

The lower member of the Chatsworth Formation has produced invertebrate fossils, typically deposited down slope from their location in life (Colburn et al., 1981a) and confined to geographically discontinuous beds that represent the bottommost portion of channelized turbidite sequences (Links, 1981). Where present, invertebrate fossils tend to be extremely numerous, in places forming coquina-like deposits (Welton and Alderson, 1981). The only vertebrate fossils–shark remains–are known from two locations, both south of the study area and in members older than those present in the study area (Welton and Alderson, 1981). Professional standards (BLM, 2008) state that formations which produce such invertebrate faunas, of sufficient numbers for hobby collecting, should be considered to be of moderate paleontological sensitivity; therefore, the lower member of the Chatsworth Formation is considered to possess moderate paleontological sensitivity.

The only fossils that have been attributed to the upper member of the Chatsworth Formation are microfossils. Because microfossils generally are not individually considered to be scientifically significant, the upper member of the Chatsworth Formation is considered to possess low paleontological sensitivity.

Direct Impacts

The potential for the proposed demolition and remediation activities (along with site characterization sampling and site operation activities) to affect significant paleontological resources depends on the type of activity, as well as on the paleontological sensitivity of each geological unit affected. In general, paleontological resources are considered to be affected when they are damaged or removed from the surrounding sediment other than during a scientifically controlled excavation (SVP, 1995; BLM, 2008).

Proposed demolition activities would include removal of structural components up to 5 feet below grade and primarily would affect low-sensitivity disturbed sediment. Proposed excavation and ex-situ treatments would include removal of soils up to 20 feet below grade and primarily would affect low-sensitivity Quaternary alluvium and weathered material derived from the low-sensitivity upper member of the Chatsworth Formation. New well installations could reach depths of between 50 and 900 feet below grade and predominantly would encounter the low-sensitivity upper member of the Chatsworth formation; however, deep wells, particularly in the southern portion of the study area, might encounter the moderate-sensitivity lower member of the Chatsworth Formation. Soil borings (for site characterizations) could be advanced to the top of the weathered bedrock, and therefore would affect low-sensitivity alluvium and weathered material derived from the low-sensitivity upper member of the Chatsworth Formation. General site operation activities likely would be limited to activities such as infrastructure maintenance, plantings, pipe installation, and road or culvert maintenance, and would result only in surficial impacts to low-sensitivity alluvium.

The impacts of remediation disturbance on paleontological resources can be mitigated by scientifically recovering the fossil(s). Although well installation is the primary activity that might affect paleontological resources, reconsidering the locations where wells would be installed is not recommended because the exact locations of paleontological resources in the subsurface are not known.

Figure 3 shows the geology in the study area, which is underlain predominantly by the low-sensitivity upper member of the Chatsworth Formation; impacts to scientifically significant paleontological resources are not likely in this member. However, the moderate-sensitivity lower member of the Chatsworth Formation might be encountered during well installation activities, particularly in the southern portion of the study area. Also, a small part of the southeastern portion of the study area is underlain by the lower member of the Chatsworth Formation.

Activities that do not involve excavations or other subsurface disturbances will not affect fossils buried in the sediment, including activities such as in-situ treatment operations or monitoring activities that might affect the groundwater, but not the surrounding rock. The following mitigation recommendations are applicable only to the excavation phase of any site remediation activities, when adverse impacts are most possible.

Conclusions and Recommendations

Implementation of the mitigation measures described in the following subsections would reduce the potential for adverse impacts to paleontological resources to a negligible level. In fact, any paleontological resources recovered during excavation activities could be considered a positive impact, because much of the paleontological record from California comes from monitoring excavation activities, and any fossils uncovered during excavations into this little-studied formation could contribute to this body of knowledge.

Paleontological Field Survey.
Because the majority of the site is underlain by the low-sensitivity upper member of the Chatsworth Formation, and within the study area there are no substantial geological exposures of potentially fossiliferous sediment, no field survey is recommended. Furthermore, the moderate-sensitivity lower member of the Chatsworth Formation, which could be affected by well installation activities, could not be surveyed adequately in the study area without substantial and more invasive excavation.

Monitoring and Mitigation Plan.
Once NASA selects an alternative (including which buildings would be demolished and what types of remedial technologies would be applied to clean up soil and groundwater contamination), a paleontological monitoring and mitigation plan (PRMMP) should be developed, in compliance with CEQA and other relevant legislation, to be

implemented for activities that would extend to the moderate-sensitivity lower member of the Chatsworth Formation. The PRMMP should outline a coordination strategy so that construction disturbances of the moderate-sensitivity lower member of the Chatsworth Formation would be monitored adequately. The PRMMP should stipulate the frequency of monitoring, methods of sampling and other appropriate procedures. It also should detail the significance criteria to be used for deciding which resources would be recovered for their data potential. The PRMMP should detail methods of recovery, post-excavation preparation and analysis of specimens, final curation of specimens at an accredited facility, data analyses, and reporting. The PRMMP should stipulate that paleontological work undertaken during this project will be conducted by qualified professionals.

Construction Personnel Training.
For activities that extend to the moderate-sensitivity lower member of the Chatsworth Formation, construction personnel should be trained in recognizing possible buried paleontological resources and protecting paleontological resources during activities in the moderate-sensitivity lower member of the Chatsworth Formation in compliance with CEQA and other relevant legislation. This training should occur before activities that could affect the lower member of the Chatsworth Formation are initiated. Construction personnel should be trained on the procedures to be followed upon the discovery of paleontological materials. Personnel should be instructed that unauthorized collection or disturbance of fossils is unlawful.

References

Almgren, A. A. 1981. “Foraminifera of the Chatsworth Formation.” *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 43-50.

Bottjer, D. J. 1981. “Trace Fossils from an Upper Cretaceous Deep-Sea Fan, Simi Hills, California.” *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 59-62.

Colburn, I.P., L. E. R. Saul, and A. A. Almgren. 1981. “The Chatsworth Formation: A New Formation Name for the Upper Cretaceous Strata of the Simi Hills, California.” *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 9-16.

Colburn, I. P. 1981. “Paleogeographic Interpretation of the Chatsworth Formation.” *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 103-105.

County of Ventura. 2011. *Ventura County General Plan*. June. Available online: http://www.ventura.org/rma/planning/general_plan/general_plan.html. Website accessed October 2011.

Filewicz, M. V. 1981. “A Preliminary Study of the Calcareous Nannofossils of the Chatsworth Formation.” *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 51-52.

Kew, W. S. W. 1924. “Geology and oil resources of a part of Los Angeles and Ventura Counties, California.” United States Geological Survey Bulletin 753, scale 1:62,500.

Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, 134 p.

MWH. 2007. *Geologic Characterization of the Central Santa Susana Field Laboratory, Ventura County, CA.* Prepared for the Boeing Company, the National Aeronautics and Space Administration, and the United States Department of Energy. August. 90 p.

MWH. 2009. *Draft Site-Wide Remedial Investigation Report, Santa Susana Field Laboratory, Ventura County, California.* Prepared for The Boeing Company, The National Aeronautics and Space Administration, and the United States Department of Energy. June. 648 p.

Nicholson, C., C. C. Sorlien, T. Atwater, J. C. Crowell, and B. P. Luyendyk. 1994. "Microplate capture, rotation of the western Transverse Ranges, and initiation of the San Andreas transform as a low-angle fault system." *Geology*, v. 22 p. 491-495.

PaleoBiology Database. n.d. Locality search. Online: http://paleodb.org/. Accessed: October2011.

Popenoe, W. P. and L. R. Saul. 1987. "Evolution and Classification of the Late Cretaceous-Early Tertiary Gastropod *Perissitys*." *Contributions in Science*, n. 380, 37 p.

Saul, L. R. and J. M. Anderson. 1981. "Late Cretaceous Mollusca of the Simi Hills: An Introduction." *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. 1981. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 29-42.

Society of Vertebrate Paleontology (SVP). 1995. "Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources B Standard Guidelines." *Society of Vertebrate Paleontology News Bulletin* 163:22–27.

U.S. Bureau of Land Management (BLM). 2008. *Potential Fossil Yield Classification System for Paleontological Resources on Public Lands.* U.S. Department of the Interior. Instructional Memorandum 2008-009. Washington, D.C.

University of California at Berkeley Museum of Paleontology (UCMP) n. d. UCMP Locality Search. Online: http://ucmpdb.berkeley.edu/loc.html.

Waring, C. A. 1917. "The stratigraphic and faunal relations of the Martinez to the Chico and Tejon of Southern California." California Academy of Sciences Proceedings, 4th ser., vol. 7, pp. 42-124.

Welton, B. J. and J. M. Alderson. 1981. "A Preliminary Note on the Late Cretaceous Sharks of the Chatsworth Formation at Dayton Canyon, Simi Hills, Los Angeles County, California." *In:* Link, M. H., R. L. Squires, and I. P. Colburn, eds. *Simi Hills Cretacoues Turbidites, Southern California.* Society of Economic Paleontologists and Mineralogists, Los Angeles, California, p. 53-58.

End of Appendix J

APPENDIX K

Public Comments on Environmental Impact Statement

This page intentionally left blank.

APPENDIX K

Scoping Comment Responses for the Environmental Impact Statement for Remediation and Demolition Activities on the NASA-Administered Property at Santa Susana Field Laboratory

Introduction

NASA is the federal lead agency for meeting the National Environmental Policy Act (NEPA) requirements to evaluate the impacts to the environment from proposed activities resulting from the cleanup of soil and groundwater and associated demolition of structures on the NASA-administered property at Santa Susana Field Laboratory (SSFL) in Ventura County, California. Environmental review of the proposed project is one element of the federal requirements. NASA has elected to conduct an Environmental Impact Statement (EIS). Scoping, as defined in the Council on Environmental Quality (CEQ) Regulations Section 1501.7, is an early step in this NEPA process during which the public, agencies, and interested stakeholders are engaged in defining the scope and range of considerations for the EIS. More specifically, public scoping helps identify the range of activities, alternatives, environmental effects, and measures to be analyzed in depth. NASA seeks to engage the community and one method of doing so is to prepare a Responsiveness Summary regarding comments received during the Scoping Period. This allows sharing of comments received and explains NASA's general approach and responses to the primary concerns. Public scoping helps NASA prepare a comprehensive and focused EIS by identifying environmental resources and concerns that are important to the community. The scoping does not resolve differences concerning the merits of a project or anticipate the ultimate decision about a proposed project.

The project's public scoping process is to:

- Inform public agencies and interested members of the public about the Proposed Action, including compliance with NEPA and NASA's actions.
- Assist with identifying the range of concerns and project-related issues to be considered in the EIS.
- Assist with identifying mitigation measures, strategies, and approaches to mitigation that might be useful and explored further in the EIS.
- Develop an expanded mailing list of agencies and individuals interested in the future actions relative to the EIS.

A Notice of Intent (NOI) was published in the *Federal Register* on July 6, 2011. The NOI notifies interested agencies, organizations, tribal governments and individuals of NASA's intent to prepare an EIS to comply with NEPA. A draft EIS then was prepared by NASA to include evaluation of alternatives to address soil and groundwater cleanup and possible demolition of structures on the federally owned portions of SSFL administered by NASA known as Area II and a part of Area I (also referred to as the LOX, or liquid oxygen plant). NASA also will use this NEPA process to comply with Section 106 of the National Historic Preservation Act NHPA). Section 106 lays out the procedure for consultation with Native Americans, the California State Historic Preservation Office (SHPO), the Advisory Council on Historic Properties (ACHP), and other consulting parties regarding federally-owned historic districts and cultural sites where an action is proposed by the federal government.

The NOI initiated a public comment-scoping period that began on July 8, 2011 and ended on September 19, 2011. During that period, NASA hosted a series of public scoping meetings:

- August 16, 2011: Chatsworth Hotel, 9777 Topanga Canyon Road, Chatsworth, CA 91311
- August 17, 2011: Grand Vista Simi Valley, 999 Enchanted Way, Simi Valley, CA 93065
- August 18, 2011: Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

In addition to the NOI publication, NASA advertised these meetings and provided project updates in the following ways:

1. Published an article in the NASA FieldNOTES newsletter, distributed by U.S. mail to more than 60,000 local residences, as well as to interested parties. The newsletter article discussed the kick-off of the NEPA process.
2. Distributed by email on July 6, 2011, a notice to the more than 600 e-mail addresses on the SSFL Program distribution list announcing the public scoping meetings.
3. Published newspaper advertisements on August 5, 2011, in English in the *Ventura County Star*, the *Los Angeles Daily News*, and the *Simi Valley Acorn*, and in Spanish (August 7, 2011) in *La Opinion*.
4. Distributed a "reminder" email on August 12, 2011, to the SSFL Program distribution list regarding the then-upcoming public scoping meetings.
5. Tweeted notice (February 15, 2011) of the scoping meetings by NASA's Environmental Communications Twitter account (@NASAEnvComm http://twitter.com/nasaenvcomm).
6. Posted the public notice and other project updates pertaining to the NEPA and Section 106 planning processes on the project Web site: http://ssfl.msfc.nasa.gov/environmental-cleanup/environmental-impact-statement/.
7. Identified mechanisms and contact information for public submission to NASA of comments and questions.

NASA contacted Native American tribes by direct mail and invited them to the scoping meetings.

NASA prepared a fact sheet summarizing the project description, initial alternatives, and contact information for the scoping meeting. The NOI, meeting materials, and publications complied with Section 508 of the federal Rehabilitation Act so that the information on the NASA web page was accessible and available to people with disabilities.

NASA accepted written and verbal submittals of comments from public scoping meetings and throughout the 74-day scoping period (July 8 through September 19, 2011). During the public meetings hosted August 16 through August 18, 2011, 55 oral submittals were transcribed by a court reporter. Also, 231 submittals from agencies, organizations, and individuals were received by e-mail, U.S. postage, or hand delivery at the meetings. Because many submittals contained multiple comments in each submittal, about 756 individual comments were identified.

Summary of comment submittal totals (some individuals spoke multiple times or submitted multiple emails – each is counted separately in the following):

- Oral submittals at public meetings 55
- Written submittals during meetings 3
- Written submittals after meetings (e-mail) 228
- Total Submittals Received 286

(These totals do not include letters and emails submitted to NASA following the end of the Scoping Comment period.)

Most submittals included one or more similar themes and naturally fell into groupings of like topics:

- Complete cleanup to background in accordance with standards in the December 2010 Administrative Order on Consent (AOC) signed between NASA and the California Department of Toxic Substances Control (DTSC)
- Support a balanced cleanup that considers the resources and future use of the site
- Limit the alternatives evaluated in the EIS to only cleanup to background agreed to in the AOC
- Support a comprehensive EIS evaluation and range of alternatives for better decision-making and to evaluate benefits of a cleanup to background versus another alternative
- Preserve the valuable natural, historical, and cultural resources at SSFL

- Coordinate better with DTSC and other responsible parties
- Address transportation routes and effects of potentially increased traffic
- Oppose the AOC in general and its requirements for cleanup to background
- Consider future use of the site and understand General Service Administration's (GSA's) plans
- Investigate offsite contamination and related health effects
- Investigate and study groundwater contamination
- Understand more about how the future look-up tables (and future cleanup standard) will be developed
- Consider multiple cleanup technologies for inclusion in the EIS
- Take into account radiological contaminants and include them in the disposal of soil

Individual comments were then placed in the above categories. Some comments included a variety of themes so a single commenter's comments may have been placed in multiple categories. A few comments did not relate to any of these themes and were categorized as "miscellaneous." Of the approximately 756 separate comments identified in the scoping meeting comments (including public meeting comments, e-mails, and letters received) the percentage of comments in each category was:

- Comply with AOC and Cleanup to Background – 37 percent
- Limit Alternatives Evaluated in the EIS – 34 percent
- Preserve Natural, Historical, and Cultural Resources – 9
- General Comments Regarding Contaminants and Health Effects – 4 percent
- Multiple Cleanup Technologies Should Be Considered – 3 percent
- Opposition to AOC and Cleanup to Background - 2 percent
- Support a Balanced Cleanup – 2 percent
- Concerns About Future Use of Site - 2 percent
- Support Comprehensive EIS Evaluation - 1 percent
- Groundwater Investigation and Studies – 1 percent
- Development of Look-up Tables (Cleanup Standard)– 1 percent
- Radiological Contaminants and Disposal of Soil – 1 percent
- Coordinate Better with DTSC and Other Responsible Parties – 1 percent
- Transportation Routes – 1 percent

This document is NASA's response to those comments. The comments have been consolidated into the categories discussed previously e with examples of the comment language followed by NASA's response.

Summary Comments and Responses

Comment Category: Comply with AOC and Cleanup to Background

Synopsis of Comments:

Many comments urged NASA to comply with the AOC. An example comment is, "I strongly urge NASA to comply rigorously with the agreement to clean up the site to background." Another example is "…you [NASA] are bound by the agreement to clean up to background level! Period! Stop dragging your feet. Get on with the cleanup!" Others questioned whether NASA were trying to select a cleanup standard different from the AOC, for example, "Its [NASA's] recent NOI was so poorly crafted that significant confusion has resulted in the community as to whether NASA was trying to break out of the AOC requirement to cleanup to background."

NASA's Response:

NASA's August 8, 2011 letter to DTSC reiterated NASA's commitment to the AOC and cleanup of the federally-owned portion of SSFL. NEPA is a statutory requirement (42 U.S.C. 4321 *et seq.*) and as such is reflected as a

requirement of the AOC. The AOC obligates NASA to make specific decisions on how to conduct a cleanup to background in accordance with NEPA. As a result, the implementation of NEPA is consistent with the requirements of the AOC. In NASA's EIS, the Proposed Action is the cleanup to background levels as agreed to in the AOC. NEPA requires NASA to evaluate a range of alternatives. For the Proposed Action, NASA considered a range of remedial technologies to address how to best meet the cleanup goal. The EIS considers the potential effects of the range of technical options related to the Proposed Action. Completing the NEPA process will provide NASA the necessary information to make an informed decision on how best to conduct a cleanup to background in accordance with the AOC, thereby avoiding or mitigating potential unintended environmental consequences.

With regard to NEPA the AOC specifically requires the following:

4.0. ENVIRONMENTAL REVIEW PROCESSES

4.2. National Environmental Policy Act (NEPA).

4.2.1. NASA shall make its specific decisions on how to conduct the cleanup to background defined in this Agreement in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 *et seq.).*

4.2.2. DTSC shall cooperate with and provide necessary information for NASA to conduct NEPA.

4.2.3. NASA shall conduct all activities under this Order in a way that will promptly comply with the requirements of NEPA. DTSC shall not approve these activities prior to complying with the requirements of CEQA.

By following the NEPA process, NASA complies with its statutory requirements (42 U.S.C. 4321 *et seq.*) and Section 4.0 of the AOC. NASA continues to work expeditiously with DTSC and the public to complete the actions called for in the AOC.

Comment Category: Limit Alternatives Evaluated in the EIS

Synopsis of Comments:

There was a number of mostly identical comments requesting limiting the alternatives evaluated in the EIS. Example comments include, "*The scope of the alternatives that NASA is proposing to evaluate in its EIS must be modified because all but one of the current alternatives are inconsistent with the AOC.*" Or "*NASA should limit the scope of review to what is required in the cleanup agreement--how to implement the cleanup to background—rather than considering whether to abrogate it by using less protective standards.*" Or "*We recommend that NASA narrow the scope of its environmental analysis to the decisions about which it has discretion and which do not violate the AOC…*"

NASA's Response:

NASA is committed to cleaning up its portion of SSFL in accordance with the AOC. NEPA provides the opportunity for public disclosure of the impacts of cleanup alternatives. Federal regulations promulgated by the CEQ as part of Executive Order (EO) 11991 require federal agencies to evaluate all reasonable alternatives or a range of reasonable alternatives in enough detail so that a reader can compare and contrast the environmental effects of the various alternatives. As directed by CEQ, Sec. 1502.14 the EIS shall "… (c) Include reasonable alternatives not within the jurisdiction of the lead agency[;] (d) Include the alternative of no action; [and] (e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference." Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and use common sense, rather than alternatives that simply are desirable from the standpoint of the applicant. The identification and evaluation of alternative ways to meet the purpose and need of the Proposed Action is the heart of the NEPA analysis. Consequently, NASA has identified several

alternative technologies that are being considered to meet the requirements of the AOC. The impacts of this range of technical options is evaluated in enough detail so that the public can compare and contrast the environmental effects of the various methods of achieving soil and groundwater cleanup. Additionally, the CEQ regulations require analysis of a no action alternative. This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives. It is also an example of an alternative that must be analyzed that is outside the jurisdiction of the agency.

In June 2012 NASA received correspondence from the White House CEQ that stated:

> "In view of NASA's administrative cleanup resolution with the State of California, which turns upon NASA's commitment to clean the site to background, CEQ's view is that – under this rule of reason - NASA is not compelled to consider less comprehensive cleanup measures as alternatives."

NASA issued the following statement:

> "We received comments from Senator Boxer and the Council on Environmental Quality regarding the evaluation of alternatives for the preparation of our Environmental Impact Statement. As a result, NASA has chosen to streamline its review in the Draft Environmental Impact Statement (DEIS) and analyze only the alternatives of (a) cleanup to background and (b) the no-action alternative."

NASA's decision was published on NASA's web site http://ssfl.msfc.nasa.gov/environmental-cleanup/environmental-impact-statement/. Afterwards, the Agency received several letters from interested parties including the San Fernando Valley Audubon Society, Santa Susana Mountain Park Association, National Park Service, California State Historic Preservation Office and private individuals requesting NASA to reconsider its decision to limit alternatives. Included among the letters was a legal memorandum prepared for the Santa Ynez Band of Chumash Indians that questions the legality of limiting the scope of an EIS to only the Proposed Action and the No Action Alternative. NASA considers the NEPA process essential to enabling the public to be fully informed of the environmental cleanup process alternatives. Engaging in this process affords NASA critical knowledge to make informed decisions relative to the SSFL cleanup, thereby avoiding potential unintended environmental consequences. NASA decisions regarding how to best conduct a cleanup in accordance with the AOC will be made after NASA completes the NEPA process.

Comment Category: Preserve Natural, Historic, and Cultural Resources

Synopsis of Comments:

There were many comments urging NASA to protect natural and cultural resources at the site. Example comments are "*As much as possible, before, during and after the SSFL cleanup operations, the natural, cultural, historical, and archaeological treasures must be protected and preserved to be enjoyed by present and future generations[.]*" and "*I strongly urge preservation of these elements (test stands and rock art) of the Santa Susana Field Laboratory and their eventual incorporation into an environment that permits controlled and informed public access.*"

NASA's Response:

NASA is considering the potential effects of project alternatives and related actions on natural, cultural, and historic resources. As part of NASA's implementation of the National Historic Preservation Act (NHPA) Section 106 Consultation, NASA is consulting with the appropriate regulatory agencies and other consulting parties to identify the potential effects of each alternative on historic properties and cultural and natural resources. Following the scoping meetings NASA created a portion of its webpage to facilitate the public's application for a request to be a "Section 106" consulting party. (http://ssfl.msfc.nasa.gov/environmental-cleanup/environmental-impact-statement/nhpa_section_106.aspx) The consulting parties will discuss potential mitigation for several cleanup options. The EIS will analyze the potential effects of the Proposed Action on resources and the Record of Decision will include appropriate mitigation measures that may offset

these impacts. Public input regarding these effects and related mitigation measures (included in the draft EIS) will be considered. NASA is in consultation, under Section 7 of the Endangered Species Act, with the U.S. Fish and Wildlife Service (USFWS). NASA submitted a draft Biological Assessment and received comments from USFWS. A revised Biological Assessment was then submitted to USFWS and will be followed by the issuance of a Biological Opinion by USFWS.

Comment Category: General Comments Regarding Contaminants and Health Effects

Synopsis of Comments:

A number of comments regarded protecting public health, investigating contamination in nearby water bodies, addressing contaminant migration, addressing offsite health impacts, and monitoring the environment until the cleanup is completed. An example comment is "*…offsite testing might be the thing that gets people to calm down once they realize there is nothing out here, or maybe there is something and they do have a reasonable argument.*" One commenter noted that "*[t]he EIS should address the migration of contaminants off the site…,*" while another commenter asked that the scope of the EIS include "*…an epidemiological study of the illnesses of residents in the area*" and a "*[s]tudy of surface water risks in all directions from the site*."

NASA's Response:

NASA has based its proposed remediation area on previous and ongoing soil site characterization studies. Some contamination extends off the NASA-administered property but is located within the SSFL facility. NASA's EIS evaluates the potential environmental effects (such as air quality, impacts to critical resources, and greenhouse gas emissions) of NASA's proposed demolition and environmental cleanup actions on SSFL. The EIS considers direct and indirect effects of these actions and will develop mitigations (if needed) to offset these impacts. The scope of the EIS analysis will not include an offsite health study, a study of the effects of contamination, or offsite sampling. Sampling of contaminated media (such as soil) extends from the source outward (and even offsite, if needed) to identify the location and extent of the contaminated media. This is part of the data gathering included in the current Field Sampling Plans.

Comment Category: Multiple Cleanup Technologies Should be Considered

Synopsis of Comments:

Several commenters suggested technologies for consideration and supported looking at many alternatives. One said "*I also think, as I said before, that all potential remediation activities must be considered at all sites, including encapsulation or storage on site.*"

NASA's Response:

NASA is considering a range of remedial action alternatives to compare t impacts from various cleanup actions. The EIS considers the effects of each cleanup option (such as, excavation, ex situ treatments, soil vapor extraction) on items such as native vegetation, air quality, truck traffic, noise, wildlife, and cultural resources at SSFL.

For soil, a focus was placed on identifying technologies that have the potential to successfully destroy or degrade the contaminants of concern (COCs), which are identified as "treatable COCs". The treatable COCs include polycyclic aromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPHs), and volatile organic compounds (VOCs). In comparison, non-treatable COCs in soil cannot readily be destroyed or degraded and will require excavation and offsite disposal. Non-treatable COCs include dioxins, polychlorinated biphenyls (PCBs), metals, pesticides, and energetics.

For this DEIS analysis more than 40 technologies initially were considered. In view of the restrictions in the AOC for remedial action, geologic setting, site-specific COCs, effects on specific habitat, and other site-specific components (available power, site access, size of site, and extent of contamination), six technologies met the evaluation criteria thus were considered most promising for pilot test implementation. They are Land

Farming, Bio Venting, Chemical Oxidation, Thermal Desorption, Soil Vapor Extraction, and Soil Washing. In some cases, complementary technologies were combined with other candidate alternatives for evaluation.

Comment Category: Opposition to AOC and the Cleanup to Background

Synopsis of Comments:

Some comments opposed the AOC and a cleanup to background. An example comment noted that "*…changes to the AOC may be necessary.*" One commenter noted that the AOC provides "*…no room for balancing, no reason*" and another commenter added that the site should "*…remain recreation and that the soil not be too disturbed.*" Another comment was that risk assessments should be considered for determining cleanup levels.

NASA's Response:

NASA notes the opposition from these commenters for following the AOC and cleaning up to background.

Comment Category: Support a Balanced Cleanup

Synopsis of Comments:

There were several comments seeking a balanced cleanup approach that considers the preservation of historic, cultural, and natural resources. Most of these said that the protection of public safety was most important. Example comments include "*I want to protect the cultural, the historic, and archeological [resources], but I want to do it in a safe manner*" and "*Other analysis should be performed so as to articulate the value of existing land use entitlements, infrastructure, site work, and facilities that could be put to use for a variety of functions to accommodate economic development and job growth."*

NASA's Response:

NASA considered the potential effects of the Proposed Action on cultural, historic, prehistoric, and archaeological (Native American) resources. NASA is consulting with the appropriate regulatory agencies to identify the potential effects of the Proposed Action on historic properties and cultural, archaeological, and natural resources. Section 106 of the NHPA requires federal agencies to consider the potential effects of their proposed actions on historic properties. (Section 106 refers to such actions as "undertakings".) The Section 106 process seeks to incorporate historic and cultural values into project planning through consultation among the federal and state agencies, and other parties with an interest in the effects of an undertaking on historic properties. The various consulting parties are working together to discuss options, provide multiple viewpoints, and strive to seek common agreement on the incorporation of historic preservation values into the project.

The protection of public health and safety would take priority over protection of the historic and cultural sites. Moreover, the EIS considers preservation of resources in areas that do not require remedial action or where remediation goals are possible without the removal of structures, including the historic test stands.

A decision about future land use of the site is not within NASA's purview nor part of NASA's EIS. As required by NEPA, the EIS considers a Proposed Action (consisting of demolition and several technical options for soil and groundwater cleanup) along with the No Action Alternative. Any decision on the future land use will be made as part of the disposition process through the GSA. GSA will be conducting a separate NEPA review to address the potential impacts of transferring the property out of federal ownership. NASA notes that cleaning up its portion of SSFL to background in accordance with the AOC will ensure that any option for future use of the property will not be impeded by any remaining soil contamination.

Comment Category: Concerns About Future Use of Site

Synopsis of Comments:

Some comments requested that the cleanup be based on future use and that the future use be open space. A related comment also expressed concern about GSA's plans for the site.

NASA's Response:

A decision about future land use is not within NASA's purview nor part of NASA's EIS. As required by NEPA, the EIS considers several cleanup and demolition options within the Proposed Action cleanup to background and the No Action Alternative. Any decision on future land use will be made as part of the disposition process conducted by the GSA. GSA will be undertaking a separate NEPA review to address the potential impacts of transferring the property out of federal ownership. NASA notes, however, that cleaning up its portion of SSFL to background in accordance with the AOC will ensure that any option for future use of the property will not be impeded by remaining soil contamination.

Comment Category: Support Comprehensive EIS Evaluation

Synopsis of Comments:

There were several comments offering support of the scope of the EIS review. Example comments are *"…the EIS is going to be very important because it's going to give us a true basis of something …"*; *"…the information contained in this EIS is important…"*; and "*I fully endorse your approach, NASA's approach, to the EIS.*"

NASA's Response:

NASA notes that these commenters and subsequent letters support a comprehensive EIS that includes the alternatives originally proposed during the scoping period. However, the use of the range of alternatives proposed prior to the Scoping Comment period was altered following the comment period. On July 18, 2012, NASA published the following on its website: "We received comments from Senator Boxer and the Council on Environmental Quality regarding the evaluation of alternatives for the preparation of our Environmental Impact Statement. As a result, NASA has chosen to streamline its review in the Draft Environmental Impact Statement (DEIS) and analyze only the alternatives of (a) cleanup to background and (b) the no-action alternative."

Comment Category: Miscellaneous

Synopsis of Comments:

There were comments noting that the public did not understand the NEPA process.

NASA's Response:

At the scoping meetings NASA provided handouts, made formal presentations and discussed the NEPA process at individual posters staffed by our NEPA experts.

The link to NASA's presentations is http://ssfl.msfc.nasa.gov/documents/presentations/NASA_EIS_Scoping_Meeting_20110816.aspx.

The link to the fact sheet describing the EIS process for the specific Proposed Action is http://ssfl.msfc.nasa.gov/documents/factsheets/NASA_EIS_SSFL_Factsheet_2011-08-25.pdf.

NASA also provided a link to CEQ's publication, "A Citizen's Guide to the NEPA" at http://ceq.hss.doe.gov/nepa/Citizens_Guide_Dec07.pdf.

Information about the NEPA process is also available on the web at http://www.epa.gpv/compliance/bsics/nepa.html.

We continued to provide explanatory material and opportunities for feedback from the public, including an opportunity for public discussion of NASA's NEPA process at a community meeting on March 27, 2012.

Synopsis of Comments:

There were comments asking that non-expert members be involved in historic/cultural consultations.

NASA's Response:

Interested members of the public were notified of the opportunity to join as a Section 106 consultation party. The process for application was noted at the Scoping public comment meetings and via email to the SSFL Project email distribution list (Oct. 4, 2011) as well as in response to individual requests to become a consultation party.

Synopsis of Comments:

There were comments requesting that impacts on paleontology, transportation, and groundwater be included.

NASA's Response:

NASA considered in its EIS the potential effects of a range of technology options and potential impacts on natural (e.g., paleontology), ecological, cultural, social (e.g., transportation), and environmental (e.g., groundwater) resources at SSFL. The EIS provides a comparative analysis of the anticipated effects of the cleanup activities.

Synopsis of Comments:

There were comments wanting a security fence.

NASA's Response:

NASA recently implemented a number of security measures. NASA considers additional measures such as a security fence as part of our site investigation and oversight activities. The need for and a decision about a fence is outside the scope of the EIS.

Comment Category: Groundwater Investigation and Studies

Synopsis of Comments:

Some comments were related to studying groundwater contamination. An example comment is "*…how the groundwater problem in this area will be handled.*" One commenter asked that the scope of the EIS include a "*Study of groundwater contaminants in wells all over the valley.*"

NASA's Response:

NASA has based its proposed groundwater remediation area on previous and ongoing groundwater site characterization studies. Some contamination extends off the NASA administered property but is located within the SSFL property. NASA's EIS evaluates the potential environmental effects (such as air quality, impacts to critical resources, and greenhouse gas emissions) of NASA's proposed demolition and environmental cleanup actions on SSFL. The EIS considers direct and indirect effects of these actions and will develop mitigations (if needed) to offset these impacts. The scope of the EIS analysis will not include offsite groundwater sampling.

Comment Category: Development of Look-up Tables (Cleanup Standard)

Synopsis of Comments:

A few comments were related to understanding how the look-up tables will be developed. There was concern about not having reasonableness included in the development of the tables and the incorrect use of method detection limits (MDLs) and reporting limits (RLs) in the process. An example comment is "*I look forward to discussing these issues when DTSV [sic] starts its lookup table public deliberations. It has been said that there are ways to deal with these issues, other than to create a moonscape, and I hope to see them early in the lookup table process.*"

NASA's Response:

DTSC posted the AOC Look-Up Tables (LUTs) June 11, 2013, and final decisions on the LUT values are DTSC's to make.

Comment Category: Radiological Contaminants and Disposal of Soil

Synopsis of Comments:

There were a few comments expressing concerns about radiological contamination and the disposal of any soils containing radioactive wastes. These comments were, ; "*…tests for radiation should include all types of radiation which came from the site.*"; and "[a]*ll health impacts from the contamination that occurred and remains, should be a part of the study.*"

NASA's Response:

NASA conducted no radiological activities at SSFL, but recognizes the possibility that activities in other parts of SSFL could have resulted in deposition of radionuclides on NASA's portion of SSFL. U.S. Environmental Protection Agency (EPA) undertook a study to characterize radionuclides on Area IV (the area historically leased by U.S. Department of Energy [DOE]) and completed it in December 2012. The Area IV radiological reports present only the data and do not provide interpretation of the data. The surface and subsurface soils in Area IV do not appear to have contamination that may have migrated across Area III into Area II and Area I, with one exception, the drainages from Area IV to Area III. The following potential concerns were identified:

- Two areas of elevated (meaning exceeded draft DTSC LUT values) radiological concentrations are isolated to the Area IV/Area III boundary, but it is unknown if the elevated contamination would affect NASA-administered property.
- Drainages crossing into Area III and leading to and from the Silvernale Pond also have elevated radiological concentrations and there is a potential that this drainage may impact NASA-administered property.

In addition to EPA's radiological survey, NASA reviewed historical documents and data associated with activities on the NASA-administered portion of SSFL. This historical information will be used to inform the AOC Field Sampling Plans currently being developed. Radiological sampling will be performed on all building being demolished and on all soils being transported offsite for disposal. Appropriate facilities will be chosen in accordance with applicable laws and regulations and the 2010 AOC.

Comment Category: Coordinate Better with DTSC and Other Responsible Parties

Synopsis of Comments:

Many comments had multiple subjects covered in the same submission. One of those topics was a desire that NASA and DTSC coordinate more effectively. An example comment is "*NASA's coordination of its NEPA activities must be better coordinated with similar activities DTSC must conduct under the California Environmental Quality Act (CEQA).*"

NASA's Response:

NASA continues to work closely with DTSC and the public to complete the actions called for in the AOC, including the EIS. The NASA EIS is expected to be completed prior to DTSC's Environmental Impact Report (EIR) and will become a source of information for the EIR. In addition, NASA briefs DTSC both in written form and verbally at meetings as to the status of the EIS and provides advanced copies of materials prior to public release. NASA's EIS will look at the potential impacts from the federal (NASA) actions contemplated at the site, while DTSC's EIR will look at all proposed actions, both federal and private party. NASA's EIS includes an analysis of cumulative impacts that incorporates activities planned by DOE and Boeing at SSFL.

The California Environmental Quality Act (CEQA) requires environmental review of all projects that require discretionary approval by a non-federal government agency. CEQA compliance is DTSC's responsibility. NASA

will provide DTSC with information from NASA's EIS for DTSC's EIR, including backup data such as the surveys that informed NASA's analysis.

Comment Category: Transportation Routes

Synopsis of Comments:

Some comments identified concerns about the volume of wastes to be transported offsite and the routes through the communities. These comments had a wide variety of themes such as: (1) provide information on the number of trucks required to travel to and from the site daily and the hours of operation; (2) provide information on how many total truck loads will be needed; (3) provide transportation routes; (4) consider constructing a dedicated new road for trucks, and (5) greenhouse gas emissions from truck traffic.

NASA's Response:

One of the technologies considered is soil excavation and offsite disposal. The EIS considers several landfill/disposal facilities and includes an evaluation of the potential traffic, roadway, noise, and air quality effects (including greenhouse gas emissions) of using these routes. As part of the NEPA process and in accordance with Executive Order (E.O.) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, the EIS considers the potential for disproportionate impacts, including health concerns to minority and low-income populations. Building an additional road was considered.

Actions NASA Has Taken based on Comments

During the 74-day scoping period NASA received 286 separate comment submittals. The public comments were essential to guiding our approach for the draft Environmental Impact Statement. Following the close of the comment period NASA refined the definition of the Proposed Action, streamlined the alternatives to be reviewed, and initiated the environmental analysis. Matters raised during the scoping period and in early consultation were considered in the analysis and are reflected in the Draft EIS.

Based on other specific requests, NASA also made the following changes to the planning process:

- Contracted a Native American monitor to accompany the field archaeologists during an archaeological survey completed in October 2011.
- Included a California red-legged frog habitat survey and looked for bryophytes and invertebrates along the rock outcrops (where feasible), during the wetlands delineation.
- Analyzed soil conditions around the offsite Braunton's milkvetch (*Astragalus brauntonii*) to determine whether common conditions occur on the NASA-administered property.
- Encouraged applications from community members and groups to participate as NHPA Section 106 consulting parties.
- Considered additional remedial technology options based on specific public request (for example, storage and encapsulation and monitored natural attenuation).
- Considered roadway repairs and a new access route.
- Incorporated information from DOE's quantitative study of existing noise and traffic conditions.
- Hosted an informational meeting in March 2012 to provide an additional opportunity to share initial findings with the public and collect additional feedback prior to completion of the Draft EIS.
- Coordinated with Boeing and DOE regarding related activities that might affect parallel planning processes and coordinated with DTSC to ensure their awareness of NASA's approach and findings.

This page intentionally left blank.

APPENDIX L

Agency Consultation and Coordination Correspondence

This page intentionally left blank.

L-1: National Historic Preservation Act Section 106 Consultation

This page intentionally left blank.

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Mr. Tom McCulloch
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue NW, Suite 803
Old Post Office Building
Washington, DC 20004

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Mr. McCulloch,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

This purpose of this letter is to notify you of our intent to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106, as provided for in the implementing regulations 36 CFR 800.8.

We have identified the Advisory Council on Historic Properties, the California State Historic Preservation Office, and the following Tribes as consulting parties to the NEPA process and will invite them to provide comment on the draft EIS prior to or during the NEPA comment period: Chumash, Fernandeno, Tataviam, Kitanemuk, Serrano, Vanyume, Shoshone Paiute, and Yaqui.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

Your response to this letter, acknowledging your interest in participating in this undertaking as a consulting party, and in commenting on our determination of the project's Area of Potential Effects (APE), is greatly appreciated. You may contact us at any time for assistance with the process and/or the undertaking.

NASA also invites the ACHP to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov .

Should you have any questions regarding this proposal or desire additional information, please contact me at 256-544-0662, or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 and ashley.e.boudreaux@nasa.gov.

Sincerely,

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Dr. Milford Wayne Donaldson
State Historic Preservation Officer
OFFICE OF HISTORIC PRESERVATION
1725 23rd Street, Suite 100
Sacramento, CA 95816

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Dr. Donaldson,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

The purpose of this letter is to notify you of our intent to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106, as provided for in the implementing regulations 36 CFR 800.8.

We have identified the California State Historic Preservation Office, the Advisory Council on Historic Properties and the following Tribes as consulting parties to the NEPA process and will invite them to provide comment on the draft EIS prior to or during the NEPA comment period: Chumash, Fernandeno, Tataviam, Kitanemuk, Serrano, Vanyume, Shoshone Paiute, and Yaqui.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

Your response to this letter, acknowledging your interest in participating in this undertaking as a consulting party, and in commenting on our determination of the project's Area of Potential Effects (APE), is greatly appreciated. You may contact us at any time for assistance with the process and/or the undertaking.

NASA also invites the California SHPO to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov .

Should you have any questions regarding this proposal or desire additional information, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or Ashley.e.boudreaux@nasa.gov.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Tom McCulloch/ACHP

California Native American Contact List

Los Angeles and Ventura Counties
June 10, 2011

Charles Cooke
32835 Santiago Road
Acton , CA 93510
suscol@intox.net

(661) 733-1812 - cell
suscol@intox.net

Chumash
Fernandeno
Tataviam
Kitanemuk

Barbareno/Ventureno Band of Mission Indians
Julie Lynn Tumamait
365 North Poli Ave
Ojai , CA 93023
jtumamait@sbcglobal.net
(805) 646-6214

Chumash

Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks, CA 91362
folkes@msn.com
805 492-7255
(805) 558-1154 - cell
folkes9@msn.com

Chumash
Tataviam
Ferrnandeño

Patrick Tumamait
992 El Camino Corto
Ojai , CA 93023
(805) 640-0481
(805) 216-1253 Cell

Chumash

San Manuel Band of Mission Indians
James Ramos, Chairperson
26569 Community Center Drive
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX
(909) 864-3370 Fax

Serrano

San Luis Obispo County Chumash Council
Chief Mark Steven Vigil
1030 Ritchie Road
Grover Beach CA 93433
cheifmvigil@fix.net
(805) 481-2461
(805) 474-4729 - Fax

Chumash

Fernandeno Tataviam Band of Mission Indians
Ronnie Salas, Cultural Preservation Department
601 South Brand Boulevard, Suite 102
San Fernando, CA 91340
rsalas@tataviam-nsn.gov
(818) 837-0794 Office

(818) 837-0796 Fax

Fernandeno
Tataviam

Owl Clan
Qun-tan Shup
48825 Sapaque Road
Bradley , CA 93426
mupaka@gmail.com
(805) 472-9536 phone/fax
(805) 835-2382 - CELL

Chumash

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Santa Susana Field Laboratory Native American Contacts list for Field activities under the NASA, federal Lead Agency as required by federal NEPA/National Historic Preservation Act Section 106; Los Angeles and Ventura counties, California.

California Native American Contact List

Los Angeles and Ventura Counties
June 10, 2011

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838
Newhall , CA 91322
tsen2u@hotmail.com
(661) 753-9833 Office
(760) 885-0955 Cell
(760) 949-1604 Fax
Fernandeño Tataviam Serrano Vanyume Kitanemuk

Melissa M. Parra-Hernandez
119 North Balsam Street
Oxnard , CA 93030
envyy36@yahoo.com
805-983-7964
Chumash

Randy Guzman - Folkes
655 Los Angeles Avenue, Unit E
Moorpark , CA 93021
ndnRandy@yahoo.com
(805) 905-1675 - cell
Chumash Fernandeño Tataviam Shoshone Paiute Yaqui

Frank Arredondo
PO Box 161
Santa Barbara Ca 93102
ksen_sku_mu@yahoo.com
805-617-6884
ksen_sku_mu@yahoo.com
Chumash

Coastal Band of the Chumash Nation
Vennise Miller, Chairperson
P.O. Box 4464
Santa Barbara CA 93140
805-305-5517
Chumash

Santa Ynez Tribal Elders Council
Freddie Romero, Cultural Preservation Conslnt
P.O. Box 365
Santa Ynez , CA 93460
805-688-7997, Ext 37
freddyromero1959@yahoo.com
Chumash

Carol A. Pulido
165 Mountainview Street
Oak View , CA 93022
805-649-2743 (Home)
Chumash

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Santa Susana Field Laboratory Native American Contacts list for Field activities under the NASA, federal Lead Agency as required by federal NEPA/National Historic Preservation Act Section 106; Los Angeles and Ventura counties, California.

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Coastal Band of the Chumash Nation
Vennise Miller
Chairperson
P.O. Box 4464
Santa Barbara, California 93140

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Chairperson Miller,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Coastal Band of the Chumash Nation that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was

completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Coastal Band of the Chumash Nation related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304 areas.

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Owl Clan
Qun-tan Shup
48825 Sapaque Road
Bradley, California 93426

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Qun-tan Shup,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Melissa M. Parra-Hernandez
119 North Balsam Street
Oxnard, California 93030

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Melissa M. Parra-Hernandez,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of Santa Susana Field Laboratory (SSFL). The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Randy Guzman-Folkes
655 Los Angeles Avenue, Unit E
Moorpark, California 93021

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Randy Guzman-Folkes,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash, Fernandeno, Tataviam, Shoshone Paiute, and Yaqui Tribes that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash, Fernandeno, Tataviam, Shoshone Paiute, and Yaqui Tribes related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites the Chumash, Fernandeno, Tataviam, Shoshone Paiute, and Yaqui Tribes to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Beverly Salazar Folkes
Chumash Consultant
1931 Shadybrook Drive
Thousand Oaks, California 91362

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Beverly Salazar Folkes,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites the Chumash to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

San Manuel Band of Mission Indians
James Ramos
Chairperson
26569 Community Center Drive
Highland, California 92346

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Chairperson Ramos,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the San Manuel Band of Mission Indians that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the San Manuel Band of Mission Indians related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites the San Manuel Band of Mission Indians to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Charles Cooke
32835 Santiago Road
Acton, California 93510

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Charles Cooke,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash Tribe that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Carol A. Pulido
165 Mountainview Street
Oak View, California 93022

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Carol A. Pulido,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash Tribe that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was

completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Frank Arredondo
P.O. Box 161
Santa Barbara, California 93120

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Arredondo,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Fernandeno Tataviam Band of Mission Indians
Ronnie Salas
Cultural Preservation Department
601 South Brand Boulevard, Suite 102
San Fernando, California 91340

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Ronnie Salas,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Fernandeno Tataviam Band of Mission Indians that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Patrick Tumamait
992 El Camino Corto
Ojai, California 93023

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Patrick Tumamait,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of Santa Susana Field Laboratory (SSFL). The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Chumash that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Chumash related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

San Luis Obispo County Chumash Council
Chief Mark Steven Vigil
1030 Ritchie Road
Grover Beach, California 93433

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Honorable Mark Steven Vigil,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the San Luis Obispo County Chumash Council that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the San Luis Obispo County Chumash Council related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

San Fernando Band of Mission Indians
John Valenzuela
Chairperson
P.O. Box 221838
Newhall, California 91322

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Chairperson Velenzuela,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the San Fernando Band of Mission Indians that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the San Fernando Band of Mission Indians related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites the San Fernando Band of Mission Indians to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Barbareno/Ventureno Band of Mission Indians
Julie Lynn Tumamait
365 North Poli Avenue
Ojai, California 93023

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Julie Lynn Tumamait,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify the Barbareno/Ventureno Band of Mission Indians that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures

identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect the Barbareno/Ventureno Band of Mission Indians related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA also invites your Tribe to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

June 30, 2011

Reply to Attn of: AS10 (117-11)

Santa Ynez Tribal Elders Council
Freddie Romero
Cultural Preservation Consultant
P.O. Box 365
Santa Ynez, CA 93460

SUBJECT: Use of NEPA Process for Section 106 purposes; Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Romero,

The National Aeronautics and Space Administration (NASA) entered into an Administrative Order on Consent (AOC) for Remedial Action with the California Department of Toxic Substances Control (DTSC) on December 6, 2010 "to further define and make more specific NASA's obligations with respect to the cleanup of soils at Santa Susana Field Laboratory (SSFL)." As such, NASA is preparing an Environmental Impact Statement (EIS) to analyze the potential environmental impacts of demolition and cleanup activities on the NASA-administered portion of SSFL. The EIS is being prepared as required by the National Environmental Policy Act (NEPA), NASA Procedural Requirement (NPR) 8580.1, and Executive Order (EO) 12114. A Notice of Intent (NOI) will be published in the National Register on the week of July 8, 2011.

We wish to notify you that NASA intends to use the NEPA process and documentation required for the preparation of the EIS to comply with Section 106 of the National Historic Preservation Act, as provided for in the implementing regulations at 36 CFR 800.8.

A Site-wide Cultural Resources Inventory of NASA-owned Area I and Area II was completed in April 2008 and identified one site that contains multiple archeological features. This site is recorded in the National Register of Historical Places and another site is listed as eligible. NASA continues to manage this site through the SSFL Cultural Resources Management Plan. An archeological and cultural evaluation in areas not previously included or documented in NASA Area I and Area II at SSFL would be completed during the development of the EIS. Please see the attached map that shows the NASA administered Areas at SSFL.

A targeted survey and evaluation of NASA-owned Space Shuttle Facilities was completed in November 2007 and identified 2 eligible historic structures. A Site-Wide

Historic Resources Survey and Assessment of NASA-owned Areas I and II was completed in March 2009 and identified 9 eligible structures (including the 2 structures identified in 2007), 27 contributing structures, and 3 historic districts. Please see the attached map for reference to the identified structures and districts.

With this letter, NASA is seeking input on concerns that uniquely or significantly affect your Tribe related to the potential demolition of structures and cleanup activities of soil and groundwater. Early identification of Tribal concerns will allow NASA to consider ways to avoid and minimize potential impacts to Tribal resources and practices as project planning and alternatives are developed and refined.

NASA invites the Santa Ynez Tribal Elders Council to the following public scoping meetings. They are scheduled as follows:

- Chatsworth, Tuesday, August 16, 2011, 6:00- p.m.- 8:30 p.m. at the Chatsworth Hotel, 9777 Topanga Canyon Boulevard, Chatsworth, CA 91311

- Simi Valley, Wednesday, August 17, 6:00 p.m.-8:30 p.m. at the Grand Vista, 999 Enchanted Way, Simi Valley, CA 93065

- West Hills, Thursday, August 18, 9:30- 12:00 at the Corporate Pointe at West Hills, 8413 Fallbrook Ave, West Hills, CA 91304

NASA also plans to arrange a face-to-face government to government consultation and/or Site visit at your convenience around the middle of September. We would appreciate it if you could please identify your preferred primary point of contact to make arrangements for the consultation meeting and future communications.

Additional information about NASA's SSFL site, the proposed demolition and cleanup activities, and the associated EIS planning process and documentation (as available) may be found on the internet at http://ssfl.msfc.nasa.gov.

We understand that you may have concerns regarding the confidentiality of information on areas or resources of religious, traditional and cultural importance to the Tribe. We would be happy to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

Your timely response will greatly assist us in incorporating your concerns into the development of the EIS. For that purpose, we respectfully request that if you have any concerns regarding issues related to the overall undertaking, or wish to propose a date and time to participate in government to government consultation, please contact me at 256-544-0662 or the SSFL Cultural Resources Manager, Ms. Ashley Boudreaux at 256-

544-5573 or ashley.e.boudreaux@nasa.gov. Your project comments and concerns are important to us. We look forward to hearing from you in the near future.

Sincerely,

Allen Elliott
SSFL Project Director

Enclosures

cc:
Milford Wayne Donaldson/CA SHPO
Tom McCulloch/ACHP

This page intentionally left blank.

Milford Wayne Donaldson
Chairman

John M. Fowler
Executive Director

Preserving America's Heritage

July 27, 2011

Mr. Charles F. Bolden, Jr.
Administrator
National Aeronautics and Space Administration
300 E St. SW
Washington, DC 20546-0001

REF: Demolition and cleanup activities at Santa Susana Field Laboratory, Ventura County, California

Dear Administrator Bolden:

The Advisory Council on Historic Preservation (ACHP) has been invited to participate in the referenced undertaking by the National Aeronautics and Space Administration to help ensure that historic properties are fully considered in the proposed cleanup at NASA's Santa Susana Field Laboratory. NASA has also notified the ACHP that it intends to use the National Environmental Policy Act's review process to meet its responsibilities under Section 106 of the National Historic Preservation Act. Pursuant to the Criteria for Council Involvement in Reviewing Individual Section 106 Cases (Appendix A to our regulations, 36 CFR Part 800) we believe the criteria are met for our participation in this undertaking. Implementation of recommendations has the potential to have substantial impacts to important prehistoric and historic-period properties. Accordingly, the Advisory Council on Historic Preservation will participate in consultation for the demolition and cleanup activities at Santa Susana.

By copy of this letter we are also notifying Mr. Alan Elliott, Santa Susana Field Laboratory Project Director, of our decision to participate in consultation.

Our participation will be handled by Dr. Tom McCulloch, who can be reached at 202-606-8554 or at tmcculloch@,achv.gov. We look forward to working with NASA on this project.

Sincerely,

John M. Fowler
Executive Director

This page intentionally left blank.

From: Cardenas, Gloriella/SCO
To: Cardenas, Gloriella/SCO
Subject: SHPO Consultation Santa Susana Field Laboratory
Date: Wednesday, November 16, 2011 12:16:42 PM

From: Beason, Mark [mailto:mbeason@parks.ca.gov]
Sent: Friday, August 05, 2011 1:12 PM
To: Boudreaux, Ashley E. (MSFC-AS10)
Cc: Elliott, Allen (MSFC-AS01); GROMAN, JENNIFER A. (HQ-LD020); Beason, Mark; Allen, Ralph H. (MSFC-AS21)
Subject: RE: Santa Susana Field Laboratory

Hi Ashley,

Thank you for the introductory email. I look forward to working with you, too. For your records, the CA SHPO reference number for this undertaking is NASA110705A. The consultation initiation letter (dated June 30, 2011) notifies the SHPO that NASA will be using the NEPA documentation to comply with Section 106 and asks the SHPO if he will be participating in the consultation and for comments on NASA's determination of the APE for the undertaking. The SHPO will participate in this consultation. However, none of the material attached to the letter contains a description of the APE or a map illustrating it. If you can send that information, we'd be happy to comment on it. Until then, we look forward to continuing this consultation with NASA.

Mark

Mark A. Beason
State Historian II, Review and Compliance
California Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816
(916) 445-7047

From: Boudreaux, Ashley E. (MSFC-AS10) [mailto:ashley.e.boudreaux@nasa.gov]
Sent: Thursday, August 04, 2011 2:13 PM
To: Beason, Mark
Cc: Elliott, Allen (MSFC-AS01); GROMAN, JENNIFER A. (HQ-LD020)
Subject: RE: Santa Susana Field Laboratory

Hi Mark,

I'm Ashley Boudreaux, the new SSFL Cultural Resources Manager.

Below is my contact information. I look forward to working with you!

-Ashley

Ashley E. Boudreaux
NASA Cultural Resources Manager

Santa Susana Field Laboratory
MSFC Huntsville, AL 35812
Office: (256) 544-5573

From: Beason, Mark [mailto:mbeason@parks.ca.gov]
Sent: Thursday, August 04, 2011 4:11 PM
To: GROMAN, JENNIFER A. (HQ-LD020)
Cc: Elliott, Allen (MSFC-AS01); Boudreaux, Ashley E. (MSFC-AS10); Beason, Mark
Subject: RE: Santa Susana Field Laboratory

Jennifer,

Thank you for the notification regarding the scoping meetings for SSFL. We have received the consultation letter from Allen and participation letter from ACHP. I hadn't heard that Donna had been replaced, so that was also useful information.

Enjoy your tour of the NASA facilities in California. I've been to SSFL and JPL, but not Dryden yet. I can't think of any issues to discuss other than the obvious ones, especially regarding Hangar One.

Mark

Mark A. Beason
State Historian II, Review and Compliance
California Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816
(916) 445-7047

From: GROMAN, JENNIFER A. (HQ-LD020) [mailto:jennifer.a.groman@nasa.gov]
Sent: Monday, August 01, 2011 6:44 AM
To: Beason, Mark
Cc: Elliott, Allen (MSFC-AS01); Boudreaux, Ashley E. (MSFC-AS10)
Subject: FW: Santa Susana Field Laboratory

Hi Mark,
Just wanted to give you a heads up that we will be holding the Scoping meetings for Santa Susana the week of August 15th. Your office should have received a consultation letter from Allen Elliott at Marshall Space Flight Center for Santa Susana Field Laboratory that indicated we are planning to proceed with an integrated approach for NEPA and NHPA compliance. Given that there are a few sensitive issues at SSFL regarding Native American sites and the test stands – it is no surprise that ACHP has chosen to participate in the consultation (per their letter attached). Marshall has also sent letters to various Tribes. Marshall is in charge of the process and I will be on the sidelines providing advice as needed and plan to attend the scoping meetings to hear more about the public's interests at SSFL. Along the way you may hear from Ashley Boudreaux who is SSFL's Cultural Resources manager - having replaced Donna Holland. Ralph Allen still keeps an

interest in the built heritage on the site, but Ashley is the primary CRM. Let us know if you have any questions regarding the letter you should have received.

Also, I will be out at Ames early next week (the 9th) to have a look at Hangar One and the rest of Ames. The contractors already went out to inspect the Hangar last week for our Condition Assessment and Rehabilitation Plan, but I was unavailable. This will be my first chance to see it. After Ames I head down to Pasadena to visit JPL, and then SSFL and Dryden. Please let me know if there are any issues I should be aware of that come to mind regarding any of our NASA sites in California.

Warm regards,

Jennifer Groman
Federal Preservation Officer
Environmental Management Division
NASA Headquarters
Suite 5E39, Room 5B28
300 E Street SW
Washington, DC 20546-0001
(202) 358-0455 FAX (202) 358-3948

From: Office of Federal Agency Programs [mailto:ofap@achp.gov]
Sent: Friday, July 29, 2011 12:25 PM
To: Boudreaux, Ashley E. (MSFC-AS10); GROMAN, JENNIFER A. (HQ-LD020)
Cc: Susan Stratton; Tom McCulloch
Subject: Santa Susana Field Laboratory

From: Office of Federal Agency Programs
Advisory Council on Historic Preservation
Attached is our letter on the subject undertaking. (in Adobe Acrobat PDF format)
If you have any questions concerning our letter, please contact:

Tom McCulloch
202) 606-8554
tmcculloch@achp.gov
Case #4945

A free copy of Adobe Acrobat Reader can be downloaded from: www.adobe.com

From: Boudreaux, Ashley E. (MSFC-AS10)
Sent: Thursday, September 22, 2011 9:46 AM
To: Freddie Romero
Cc: GROMAN, JENNIFER A. (HQ-LD020)
Subject: SSFL EIS - Area of Potential Effect

Mr. Romero,

In response to the letter NASA sent on June 30, 2011 titled "Use of NEPA Process for Section 106 purposes: Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California" -- please see the attached information giving a more in-depth examination of the Area of Potential Effect (APE) concerning NASA's proposed undertaking of demolition of buildings at Santa Susana Field Laboratory and cleanup of contaminated soil.

Package 1 (4MB) – Removal of Structures at NASA's SSFL – Historical Summary of Structures
Package 2 (1MB) – Summary of Soil Remediation (Recreational Level, Residential Level, Industrial Level, Background Level)

Please feel free to contact me should you have any questions, or if you would like a hard copy sent to your office.

Thank you,

-Ashley

Ashley E. Boudreaux
Cultural Resources Manager
Marshall Space Flight Center
AS10 Huntsville, AL 35812
Office: (256) 544-5573

Please consider the environment before printing this email.

From: Boudreaux, Ashley E. (MSFC-AS10) <ashley.e.boudreaux@nasa.gov>
Subject: RE: SSFL EIS - Area of Potential Effect
To: "'Freddie Romero'" <freddyromero1959@yahoo.com>
Date: Tuesday, November 22, 2011, 1:51 PM
Mr. Romero,

I wanted to check in with you again to see if you, the Business Council, or the Elders have any questions about NASA's undertaking at Santa Susana Field Laboratory. Please don't hesitate to email or call my office directly if you have any questions at all.

I hope you are well!

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

May 15, 2008 In reply refer to: NASA080514A

Ralph H. Allen
Historic Preservation Officer
National Aeronautics and Space Administration
Marshall Space Flight Center
Huntsville, AL 35812

Re: Historic Resources Survey and Assessment of the NASA Facility at Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Allen:

Thank you for your letter of 12 May 2008 requesting my review and comments regarding your Historic Resources Survey and Assessment of the NASA Facility at Santa Susana Field Laboratory. You are consulting with me in order to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), and its implementing regulation found at 36 CRF Part 800 as part of the phase-out of the Shuttle Program

NASA conducted a survey and assessment of all NASA owned Space Shuttle Program facilities including the assets at the Santa Susana Field Laboratory in Ventura County. The report *Historic Resources Survey and Assessment of the NASA Facility at Santa Susana Field Laboratory* (May 2008), which you included with your present submittal, however, examines the significance of all NASA assets at the facility in a comprehensive context. As a result, NASA has determined that there are three historic districts at the Santa Susana Field Laboratory that are eligible for inclusion in the National Register under the contexts of Cold War (Military) and Space Exploration. The three districts are: the Alfa Test Area Historic District; the Bravo Test Area Historic District; and the Coca Test Area Historic District. The Alfa Area includes 10 contributing resources and 4 non-contributing resources; the Bravo Area includes eight contributing resources and one non-contributing resources; and the Coca Area includes 18 contributors and four non-contributing structures.

Based on a review of the documentation you submitted with your letter, I can concur that the Alfa Test Area Historic District; the Bravo Test Area Historic District; and the Coca Test Area Historic District are eligible for inclusion in the National Register with the contributing and non-contributing resources as listed in Table 4.1. of *Historic Resources Survey and Assessment of the NASA Facility at Santa Susana Field Laboratory* (May 2008).

Thank you for seeking my comments and I look forward to continuing our consultation. If you have any questions or concerns, please contact David Byrd, Project Review Unit historian, at (916) 653-9019 or at dbyrd@parks.ca.gov.

Sincerely,

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

This page intentionally left blank.

From: Boudreaux, Ashley E. (MSFC-AS10)
Sent: Thursday, September 22, 2011 9:46 AM
To: Freddie Romero
Cc: GROMAN, JENNIFER A. (HQ-LD020)
Subject: SSFL EIS - Area of Potential Effect

Mr. Romero,

In response to the letter NASA sent on June 30, 2011 titled "Use of NEPA Process for Section 106 purposes: Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California" -- please see the attached information giving a more in-depth examination of the Area of Potential Effect (APE) concerning NASA's proposed undertaking of demolition of buildings at Santa Susana Field Laboratory and cleanup of contaminated soil.

Package 1 (4MB) – Removal of Structures at NASA's SSFL – Historical Summary of Structures
Package 2 (1MB) – Summary of Soil Remediation (Recreational Level, Residential Level, Industrial Level, Background Level)

Please feel free to contact me should you have any questions, or if you would like a hard copy sent to your office.

Thank you,

-Ashley

Ashley E. Boudreaux
Cultural Resources Manager
Marshall Space Flight Center
AS10 Huntsville, AL 35812
Office: (256) 544-5573

Please consider the environment before printing this email.

From: Boudreaux, Ashley E. (MSFC-AS10) <ashley.e.boudreaux@nasa.gov>
Subject: RE: SSFL EIS - Area of Potential Effect
To: "'Freddie Romero'" <freddyromero1959@yahoo.com>
Date: Tuesday, November 22, 2011, 1:51 PM
Mr. Romero,

I wanted to check in with you again to see if you, the Business Council, or the Elders have any questions about NASA's undertaking at Santa Susana Field Laboratory. Please don't hesitate to email or call my office directly if you have any questions at all.

I hope you are well!

-Ashley Boudreaux

Ashley Boudreaux
Cultural Resources Manager
Santa Susana Field Laboratory
Ashley.E.Boudreaux@nasa.gov
256-544-5573

From: Freddie Romero [mailto:freddyromero1959@yahoo.com]
Sent: Tuesday, November 22, 2011 4:00 PM
To: Boudreaux, Ashley E. (MSFC-AS10)
Cc: Sam Cohen
Subject: RE: SSFL EIS - Area of Potential Effect

Ms. Boudreaux,

I don't have any issues at this time. I have included Mr. Cohen, legal and Government specialist for the tribe on this reply, in case he had any issues or comments.

Happy holidays

Thank you,

Freddie Romero
Cultural Preservation Consultant
SYBCI Elders Council
805-688-7997 X37

From: Boudreaux, Ashley E. (MSFC-AS10) <ashley.e.boudreaux@nasa.gov>
Subject: RE: SSFL EIS - Area of Potential Effect
To: "Freddie Romero" <freddyromero1959@yahoo.com>
Cc: "Sam Cohen" <scohen@santaynezchumash.org>
Date: Tuesday, November 22, 2011, 2:25 PM
Thank you Mr. Romero! I hope you have a wonderful holiday as well.

One quick question – and this is because we are doing a biological assessment at SSFL, and want to be sure we capture everything: Do the Santa Ynez consider any plants/animals special for ceremonial reasons? NASA wishes to include those species (if there are any that you identify) with our list of "sensitive species" for future use. Thank you!

-Ashley

From: Freddie Romero [mailto:freddyromero1959@yahoo.com]
Sent: Tuesday, November 22, 2011 3:01 PM
To: Ashley E. (MSFC-AS10)Boudreaux
Cc: Sam Cohen
Subject: RE: SSFL EIS - Area of Potential Effect

Ms. Boudreaux,

There are some located on the property that are useful to the native community. I can check with Pat Tumamait, who is currently working out at SSFL in area IV, that has listed those plants.

Freddie Romero
Cultural Preservation Consultant
SYBCI Elders Council
805-688-7997 X37

From: Sam Cohen [mailto:scohen@santaynezchumash.org]
Sent: Friday, November 25, 2011 11:06 AM
To: Boudreaux, Ashley E. (MSFC-AS10)
Cc: 'aqimowonkaktu@aol.com'; 'Freddie Romero'
Subject: FW: SSFL EIS - Area of Potential Effect

Dear Ms. Boudreaux:

The Santa Ynez Band of Chumash Environmental Department, specifically Ms. Carmen Sandoval, has been engaged in preparing a list of animals and plants for Chumash ceremonial reasons on the Chumash Reservation. They might be able to assist you at Santa Susana if you can answer her questions below.

Sincerely,

Sam Cohen
Government and Legal Specialist
Santa Ynez Band of Chumash Indians
Cell: 805-245-9083

From: Aqimowon ka kt+ [mailto:aqimowonkaktu@aol.com]
Sent: Wednesday, November 23, 2011 1:58 PM
To: Sam Cohen
Subject: Re: SSFL EIS - Area of Potential Effect

Haku Sam,
1. Is there a historical list of species for this site? If so, can you obtain it so I can I review it?
2. If a updated biological assessment is currently being mapped, then only after the final Master species list is produced will we be able to review and comment on it.

Carmen Sandoval

Sʰamala Chumash Senior Language Apprentice,
Sʰamala Chumash Native American Consultant
Aqimowonkaktu@aol.com
(805)325-1368

From: "Boudreaux, Ashley E. (MSFC-AS10)" <ashley.e.boudreaux@nasa.gov>
To: Sam Cohen <scohen@santaynezchumash.org>
Cc: "'aqimowonkaktu@aol.com'" <aqimowonkaktu@aol.com>, 'Freddie Romero' <freddyromero1959@yahoo.com>
Sent: Thu, Dec 1, 2011 16:57:32 GMT+00:00
Subject: RE: SSFL EIS - Area of Potential Effect

Mr. Cohen,

Currently, NASA is completing our biological surveys at SSFL and preparing a Biological Assessment.

In the attached, you will find our data indicating a historical list of multiple species of plants and wildlife encountered on NASA property at SSFL. Please let me know if you or your team have any questions about this data. We would like to be sure we categorize all species appropriately, especially if there are species that are ceremonially important to the Santa Ynez Band of Chumash.

Thank you for the opportunity to provide this information. I look forward to hearing back from you.

Please don't hesitate to call or email if you have any questions.

Thank you,

-Ashley Boudreaux

Ashley Boudreaux
Cultural Resources Manager
Santa Susana Field Laboratory
Ashley.E.Boudreaux@nasa.gov
256-544-5573

From: Sam Cohen [mailto:scohen@santaynezchumash.org]
Sent: Tuesday, December 13, 2011 2:16 PM
To: Boudreaux, Ashley E. (MSFC-AS10)
Cc: 'Freddie Romero'; 'aqimowonkaktu@aol.com'
Subject: FW: SSFL EIS - Area of Potential Effect

Dear Ms. Boudreaux:

Attached is a short description of flora and fauna and their historical uses by the Chumash.

Sincerely,

Sam Cohen
Government and Legal Specialist
Santa Ynez Band of Chumash Indians
Cell: 805-245-9083

From: Aqimowon ka kt+ [mailto:aqimowonkaktu@aol.com]
Sent: Tuesday, December 13, 2011 10:40 AM
To: Sam Cohen
Subject: Re: SSFL EIS - Area of Potential Effect

Sam here are a few species I noticed right away. If you need anything more else please let me know.

Plant Species

1. *Asclepias eriocarpa*

Common name: Broad leaved Milkweed, Jumete sp.- Culturally recognized for material culture use and ceremonial use; currently used.

2 . *Asclepias fascicularis*

Common name: Narrow leaved Milkweed, Jumete sp.- Culturally recognized for material culture use and ceremonial use; currently used.

3. ***Amsinckia menziesii***

Common name: Common Fiddleneck- Culturally recognized as a food source and ceremonial use.

4. ***Marah macrocarpus***

Common name: Wild cucumber, Manroot , Chilicote sp.- Culturally recognized for material culture use, medicinal, edible and ceremonial use; currently used.

5. ***Quercus agrifolia.***

Common name: Coast Live Oak, Encino sp.- Culturally recognized as a staple food source and ceremonial use; currently used.

6. ***Salvia columbariae***

Common name: Chia Sage, Chia sp.- Culturally recognized as a food source and ceremonial use; currently used.

Animal Species

Phrynosoma blainvillii, Anota coronatum

Common name: Coast Horned Lizard - Culturally recognized in song and ceremony.

Melanderpes formicivorus

Common name: Acorn woodpecker- Culturally recognized in oral tradition and ceremonially recognized.

Corvus brachyrhynchos

Common name: American Crow - Culturally recognized in oral tradition, song and ceremony.

Corvus corax

Common name: Common Raven - Culturally recognized in oral tradition and ceremonially recognized.

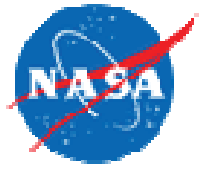
Geococcyzus californianus

Common name: Greater Roadrunner - Culturally recognized in oral tradition and ceremonially recognized.

Carmen Sandoval

Sʰamala Chumash Senior Language Apprentice,
Sʰamala Chumash Native American Consultant
Aqimowonkaktu@aol.com
(805)325-1368

National Aeronautics and Space Administration



Welcome to the NASA Section 106 Consultation Meeting

Santa Susana Field Laboratory
National Historic Preservation Act
Section 106 Consultation Meeting
March 1, 2012

Ashley Boudreaux, SSFL Cultural Resources Manager

www.nasa.gov

Agenda

1. Ground Rules
2. Introductions
3. Section 106 Overview
4. SSFL Cultural Resources Summary
5. NASA's Proposed Actions
6. Area of Potential Effect (APE) Discussion
7. Tour of Historic Districts
8. Comments/Discussion
9. Next Steps

NASA SSFL SECTION 106 CONSULTATION SIGN-IN SHEET

Meeting Date: March 1, 2012

Location: NASA Building 203, Santa Susana Field Lab and some parties by Call-in Telephone

NOTE: By agreeing to be a consulting party each of the undersigned agrees that any of their written comments may be made public.

Name	Affiliation/Self	Phone	E-mail
RONALD ZIMAN, MD	SELF	818-999-6193	rbziman@gmail.com
Mark Osokow	San Fernando Valley Audubon Society	818-347-0420	mark.osokow@sfvaudubon.org
William Preston Bowling	ACMELA.org	(310)428-5085	williampreston bowling@yahoo.com
Barbara Tejada	Self/VCAS	661-435-3372	btejada75@yah-o.com
John Luker	SSMPA	818 371-7918	j.luker2@ [illegible]
Chris Rowe	West Hills Neighborhood Council	818-481-1220	CRWHNC@gmail.com
Wayne Fishback	Self & Neighboring Property Owners	805. 341.9687	waynefishback@yahoo.com
CHRISTINA WALSH	CLEANUPROCKETDYNE.ORG	818 922 5123	
ABRAHAM WEITZBERG	SELF	818-347-5068	aweitzberg@att.net

This page intentionally left blank.

L-2: Endangered Species Act Section 7 Consultation

This page intentionally left blank.

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

August 12, 2011

Reply to Attn of: AS01

U.S. Fish and Wildlife Service
Mr. Rick Farris
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

SUBJECT: Invitation for Informal Consultation on Plant and Wildlife Surveys to Support the Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Farris:

The National Aeronautics and Space Administration (NASA) is proposing the remediation of soils and groundwater and the demolition of test stands and ancillary structures on the NASA-administered portion of the Santa Susana Field Laboratory (SSFL). To analyze the potential environmental impacts of these activities, NASA is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) implementing regulations, the NASA Procedural Requirements (NPR) for Implementing NEPA, and Executive Order (EO) 12114.

NASA is currently conducting rare plant and wildlife surveys at SSFL. Those surveys should be completed by late September 2011, and we would like a chance to meet with personnel from your office in October or November to discuss our findings and the EIS. We would also welcome the opportunity to discuss additional information that you may provide us about the biological systems at SSFL.

SSFL Site Background

The SSFL site is 2,850 acres in Ventura County, California, approximately 7 miles northwest of Canoga Park and 30 miles northwest of downtown Los Angeles. SSFL is composed of four areas known as Areas I, II, III, and IV and two unnumbered areas known as the "undeveloped land." NASA administers 41.7 acres within Area I and all 409.5 acres of Area II. The Boeing Company manages the remaining property within Areas I, III, and IV and the two undeveloped areas. The attachment shows the project area.

Since the mid-1950s, when the two Federally owned areas were owned by the U.S. Air Force, this site has been used for developing and testing rocket engines. Four test stand complexes–Alfa, Bravo, Coca, and Delta–were constructed in Area II between 1954 and

1957. Area II and the Liquid Oxygen (LOX) Plant portion of Area I were acquired by NASA from the U.S. Air Force in the 1970s.

The NASA-administered areas of SSFL also contain biological resources outside of the rocket development areas. SSFL is near the crest of the Simi Hills, which are part of the Santa Monica Mountains running east-west across Southern California. The diverse terrain consists of ridges, canyons, and sandstone rock outcrops. NASA has conducted several surveys to identify biological resources within its portion of SSFL. As a result, NASA has identified special-status plant and animal species occurring on its property.

Previous environmental sampling on the NASA-administered property indicates that metals, dioxins, polychlorinated biphenyls (PCBs), volatile organics, and semivolatile organics are present in the soils and upper groundwater (known as the Surficial Media Operable Unit). Volatile organics, metals, and semivolatile organics also are present in the deeper groundwater (known as the Chatsworth Formation Operable Unit).

Environmental Commitments

Rocket engine testing has been discontinued at these sites and the property has been excessed to the General Services Administration (GSA). GSA conditionally has accepted the Report of Excess pending: (1) NASA's certification that action necessary to protect human health and the environment with respect to hazardous substances on the property has been taken or receipt of the U.S. Environmental Protection Agency's (EPA's) written concurrence that an approved and installed remedial design is operating properly and successfully; OR (2) the Governor's concurrence of the suitability of the property for transfer per Comprehensive Environmental Response, Compensation, and Liability Act Section 120(h)(3)(C).

In 2007, a Consent Order among NASA, Boeing, U.S. Department of Energy, and Department of Toxic Substances Control (DTSC) was signed addressing demolition of certain infrastructure and environmental cleanup of SSFL. NASA entered into an Administrative Order on Consent (AOC) for Remedial Action with DTSC on December 6, 2010, "to further define and make more specific NASA's obligations with respect to the cleanup of soils at the Site." On the basis of the 2010 AOC, NASA is required to complete a Federal environmental review pursuant to NEPA. An EIS is being prepared by NASA to include demolition of site infrastructure, soil cleanup and groundwater remediation within Area II and a portion of Area I (LOX Plant) of SSFL.

As part of the environmental review process, certain studies are being completed to characterize the existing conditions and to provide information for the analysis and consultation. These include surveys for wildlife, critical habitat, rare plants, wetlands, and archaeological resources. The findings of these studies will be incorporated into the EIS.

Environmental Analysis

NASA will submit a Biological Assessment (BA) based on the existing ecological resource surveys and the data collected during the biological resources studies. The BA will be prepared and submitted to the USFWS to support Section 7 Consultation. Best management practices, such as seasonal restrictions on the work, will be reviewed.

CH2M HILL is NASA's contractor for this work and will work with NASA and the resource agencies to establish appropriate avoidance and minimization measures to reduce the impacts of the proposed action on known or potentially known sensitive habitats. In the event suitable habitat for listed species is identified in an inaccessible area of the proposed project area, listed species will be assumed to be present. The BA will address effects of the proposed action on federally listed threatened or endangered species known to occur or to have the potential to occur on the SSFL project area, including but not limited to, the following:

- Braunton's milk vetch (*Astragalus brauntonii*)
- *Dudleya* spp.
- Santa Susana tarplant (*Deinandra minthornii*)
- Quino checkerspot butterfly (*Euphydryas editha* ssp. *quino*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- California red-legged frog (*Rana aurora* ssp. *draytonii*)
- Least Bell's vireo (*Vireo bellii* ssp. *pusillus*)

In addition, potential Quino checkerspot butterfly habitat occurs on the site. The BA will include a focused survey of the NASA property for host plants that will identify the extent of the butterfly's preferred habitat.

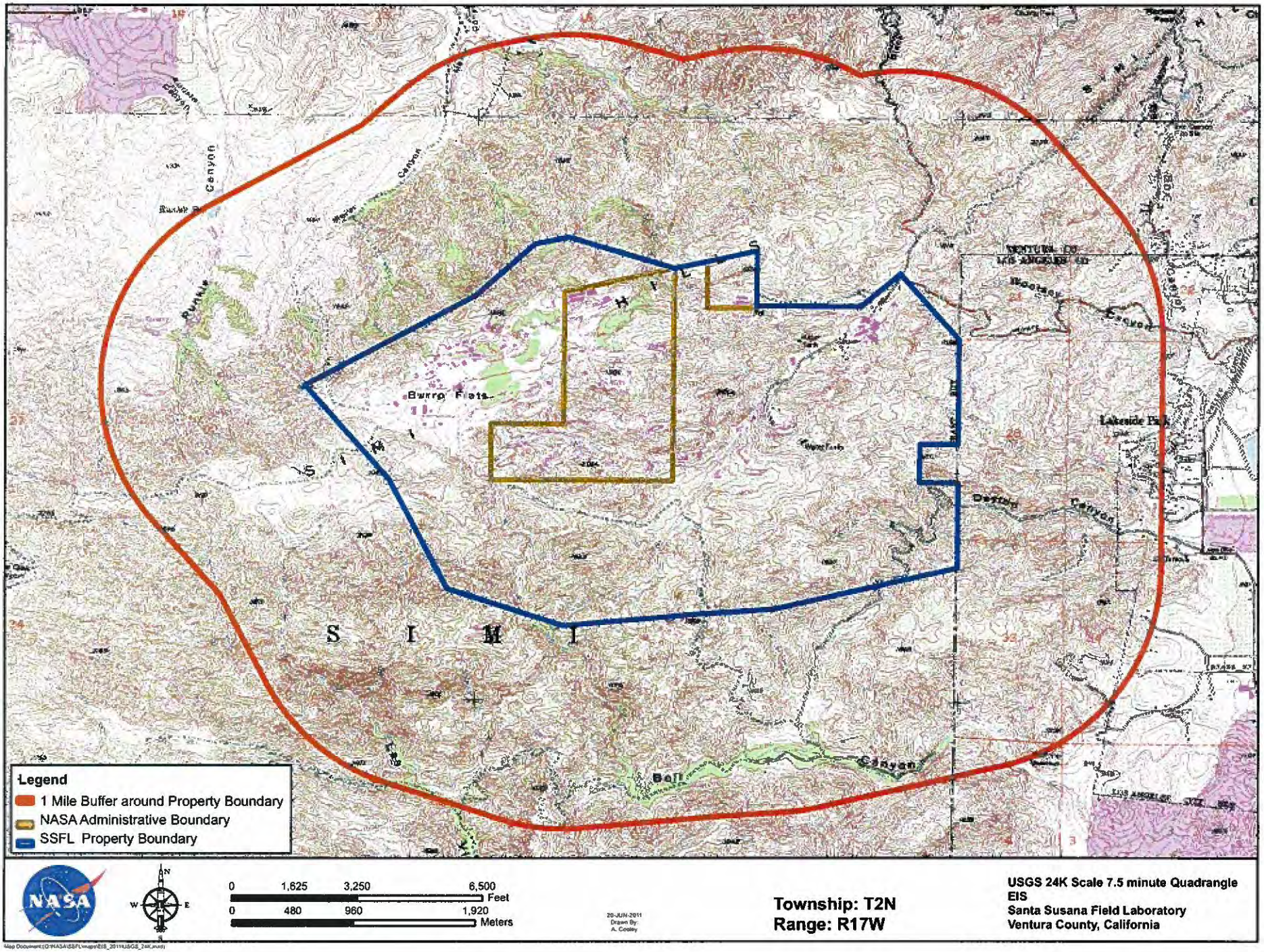
We look forward to working cooperatively with your agency to conduct these evaluations. If you have questions regarding these plans or to set up a meeting, please feel free to contact me at 256- 544-0662 or Amy Keith at 256-544-7434.

Sincerely,

Allen Elliott
SSFL Program Director

Enclosure – Site Map

cc:
AS10/Amy Keith
CH2M HILL/Beth Vaughan
CH2M HILL/Leslie Tice


Legend
1 Mile Buffer around Property Boundary
NASA Administrative Boundary
SSFL Property Boundary
Burro Flats
S I M I
Lakeside Park
Bell Canyon
0 1,625 3,250 6,500 Feet
0 480 960 1,920 Meters
20-JUN-2011
Drawn By:
A. Cooley
Township: T2N
Range: R17W
USGS 24K Scale 7.5 minute Quadrangle
EIS
Santa Susana Field Laboratory
Ventura County, California

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

August 12, 2011

Reply to Attn of: AS01

U.S. Army Corps of Engineers
Mr. David Castanon, Division Chief
USACE Regulatory Division, Los Angeles District
915 Wilshire Blvd.
Los Angeles, CA 90017-3401

SUBJECT: Invitation for Informal Consultation on Plant and Wildlife Surveys to Support the Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Castanon:

The National Aeronautics and Space Administration (NASA) is proposing the remediation of soils and groundwater and the demolition of test stands and ancillary structures on the NASA-administered portion of the Santa Susana Field Laboratory (SSFL). To analyze the potential environmental impacts of these activities, NASA is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) implementing regulations, the NASA Procedural Requirements (NPR) for Implementing NEPA, and Executive Order (EO) 12114.

NASA is currently conducting rare plant and wildlife surveys at SSFL. Those surveys should be completed by late September 2011, and we plan to meet with personnel from the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) to discuss our findings and the EIS and to provide those agencies an opportunity to provide additional information they may have about the biological systems at SSFL. We also plan to conduct wetlands delineation during the winter of 2011-12 and would like to coordinate our efforts with your office.

SSFL Site Background

The SSFL site is 2,850 acres in Ventura County, California, approximately 7 miles northwest of Canoga Park and 30 miles northwest of downtown Los Angeles. SSFL is composed of four areas known as Areas I, II, III, and IV and two unnumbered areas known as the "undeveloped land." NASA administers 41.7 acres within Area I and all 409.5 acres of Area II. The Boeing Company manages the remaining property within Areas I, III, and IV and the two undeveloped areas. The attachment shows the project area.

Since the mid-1950s, when the two Federally owned areas were owned by the U.S. Air Force, this site has been used for developing and testing rocket engines. Four test stand \ complexes–Alfa, Bravo, Coca, and Delta–were constructed in Area II between 1954 and 1957. Area II and the Liquid Oxygen (LOX) Plant portion of Area I were acquired by NASA from the U.S. Air Force in the 1970s.

The NASA-administered areas of SSFL also contain biological resources outside of the rocket development areas. SSFL is near the crest of the Simi Hills, which are part of the Santa Monica Mountains running east-west across Southern California. The diverse terrain consists of ridges, canyons, and sandstone rock outcrops. NASA has conducted several surveys to identify biological resources within its portion of SSFL. As a result, NASA has identified special-status plant and animal species occurring on its property.

Previous environmental sampling on the NASA-administered property indicates that metals, dioxins, polychlorinated biphenyls (PCBs), volatile organics, and semivolatile organics are present in the soils and upper groundwater (known as the Surficial Media Operable Unit). Volatile organics, metals, and semivolatile organics also are present in the deeper groundwater (known as the Chatsworth Formation Operable Unit).

Environmental Commitments

Rocket engine testing has been discontinued at these sites and the property has been excessed to the General Services Administration (GSA). GSA conditionally has accepted the Report of Excess pending: (1) NASA's certification that action necessary to protect human health and the environment with respect to hazardous substances on the property has been taken or receipt of the U.S. Environmental Protection Agency's (EPA's) written concurrence that an approved and installed remedial design is operating properly and successfully; OR (2) the Governor's concurrence of the suitability of the property for transfer per Comprehensive Environmental Response, Compensation, and Liability Act Section 120(h)(3)(C).

In 2007, a Consent Order among NASA, Boeing, U.S. Department of Energy, and Department of Toxic Substances Control (DTSC) was signed addressing demolition of certain infrastructure and environmental cleanup of SSFL. NASA entered into an Administrative Order on Consent (AOC) for Remedial Action with DTSC on December 6, 2010, "to further define and make more specific NASA's obligations with respect to the cleanup of soils at the Site." On the basis of the 2010 AOC, NASA is required to complete a Federal environmental review pursuant to NEPA. An EIS is being prepared by NASA to include demolition of site infrastructure, soil cleanup and groundwater remediation within Area II and a portion of Area I (LOX Plant) of SSFL.

As part of the environmental review process, certain studies are being completed to characterize the existing conditions and to provide information for the analysis and consultation. These include surveys for wildlife, critical habitat, rare plants, wetlands, and archaeological resources. The findings of these studies will be incorporated into the EIS.

Environmental Analysis

NASA will submit a Biological Assessment (BA) based on the existing ecological resource surveys and the data collected during the biological resources studies. The BA will be prepared and submitted to the USFWS to support Section 7 Consultation. Best management practices, such as seasonal restrictions on the work, will be reviewed. CH2M HILL is NASA's contractor for this work and will work with NASA and the resource agencies to establish appropriate avoidance and minimization measures to reduce the impacts of the proposed action on known or potentially known sensitive habitats. In the event suitable habitat for listed species is identified in an inaccessible area of the proposed project area, listed species will be assumed to be present. The BA will address effects of the proposed action on federally listed threatened or endangered species known to occur or to have the potential to occur on the SSFL project area, including but not limited to, the following:

- Braunton's milk vetch (*Astragalus brauntonii*)
- *Dudleya* spp.
- Santa Susana tarplant (*Deinandra minthornii*)
- Quino checkerspot butterfly (*Euphydryas editha* ssp. *quino*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- California red-legged frog (*Rana aurora* ssp. *draytonii*)
- Least Bell's vireo (*Vireo bellii* ssp. *pusillus*)

In addition, potential Quino checkerspot butterfly habitat occurs on the site. The BA will include a focused survey of the NASA property for host plants that will identify the extent of the butterfly's preferred habitat.

We look forward to working cooperatively with your agency to conduct these evaluations. If you have questions regarding these plans, please feel free to contact me at 256- 544-0662 or Amy Keith at 256-544-7434.

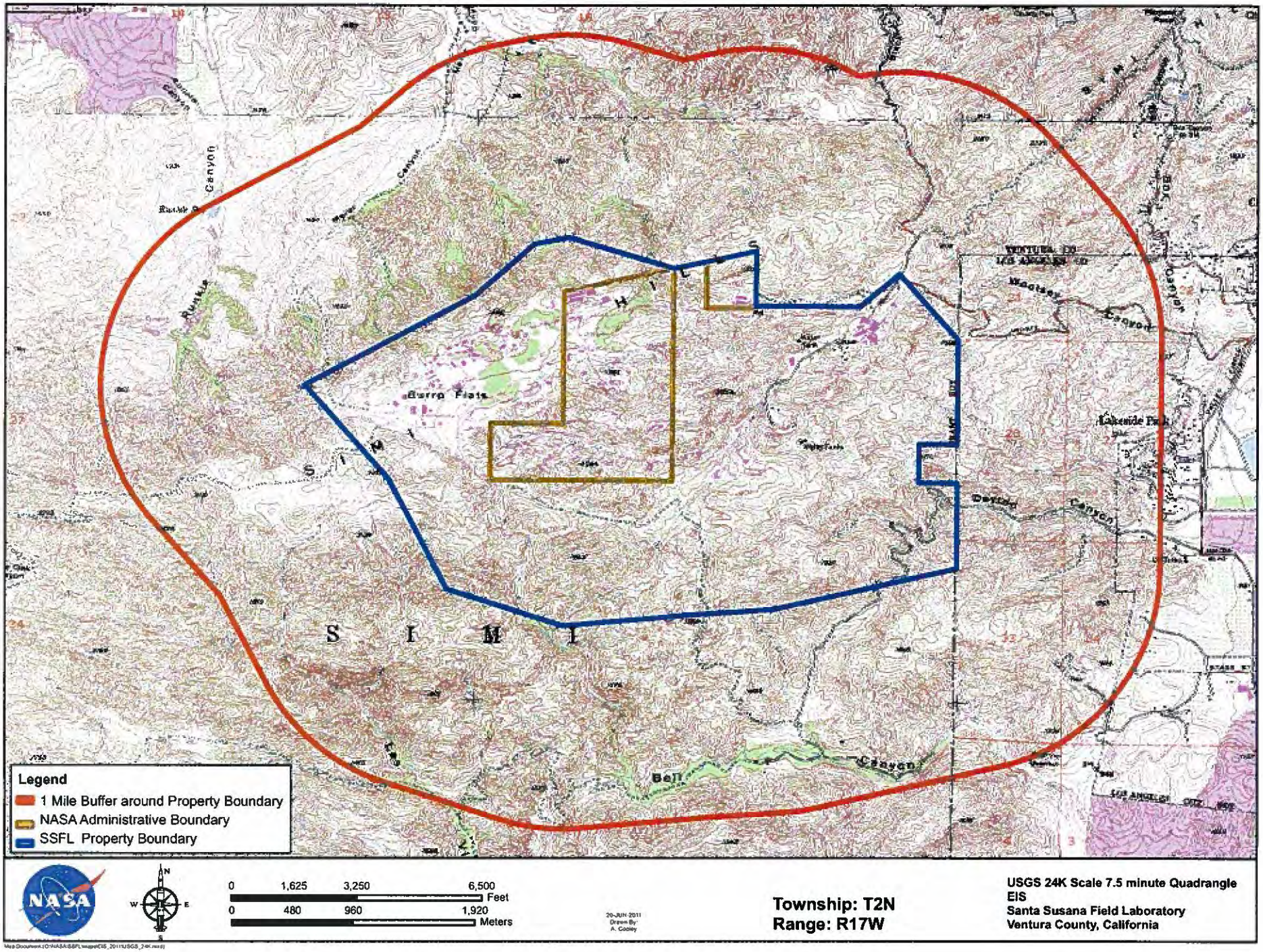
Sincerely,

Allen Elliott

Allen Elliott
SSFL Program Director

Enclosure – Site Map

cc:
AS10/Amy Keith
CH2M HILL/Beth Vaughan
CH2M HILL/Leslie Tice


Legend
1 Mile Buffer around Property Boundary
NASA Administrative Boundary
SSFL Property Boundary
S I M I
Burro Flats
Runkle Canyon
Woolsey Canyon
Lakeside Park
Dayton Canyon
Bell Canyon
VENTURA CO
LOS ANGELES CO
N
W
E
S
0 1,625 3,250 6,500 Feet
0 480 960 1,920 Meters
20-JUN-2011
Drawn By:
A. Cooley
Township: T2N
Range: R17W
USGS 24K Scale 7.5 minute Quadrangle
EIS
Santa Susana Field Laboratory
Ventura County, California

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

August 12, 2011

Reply to Attn of: AS01

Ms. Mary E. Meyer
Staff Environmental Scientist
South Coast Region
Department of Fish and Game
226 West Ojai Avenue Suite 101
PMB: 501
Ojai, California 93023

SUBJECT: Invitation for Informal Consultation on Plant and Wildlife Surveys to Support the Environmental Impact Statement for the Demolition and Cleanup Activities at Santa Susana Field Laboratory, Ventura County, California

Dear Ms. Meyer:

The National Aeronautics and Space Administration (NASA) is proposing the remediation of soils and groundwater and the demolition of test stands and ancillary structures on the NASA-administered portion of the Santa Susana Field Laboratory (SSFL). To analyze the potential environmental impacts of these activities, NASA is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) implementing regulations, the NASA Procedural Requirements (NPR) for Implementing NEPA, and Executive Order (EO) 12114.

NASA is currently conducting rare plant and wildlife surveys at SSFL. Those surveys should be completed by late September 2011, and we would like a chance to meet with personnel from your office in October or November to discuss our findings and the EIS. We would also welcome the opportunity to discuss additional information that you may provide us about the biological systems at SSFL.

SSFL Site Background

The SSFL site is 2,850 acres in Ventura County, California, approximately 7 miles northwest of Canoga Park and 30 miles northwest of downtown Los Angeles. SSFL is composed of four areas known as Areas I, II, III, and IV and two unnumbered areas known as the "undeveloped land." NASA administers 41.7 acres within Area I and all 409.5 acres of Area II. The Boeing Company manages the remaining property within Areas I, III, and IV and the two undeveloped areas. The attachment shows the project area.

Since the mid-1950s, when the two Federally owned areas were owned by the U.S. Air Force, this site has been used for developing and testing rocket engines. Four test stand complexes–Alfa, Bravo, Coca, and Delta–were constructed in Area II between 1954 and 1957. Area II and the Liquid Oxygen (LOX) Plant portion of Area I were acquired by NASA from the U.S. Air Force in the 1970s.

The NASA-administered areas of SSFL also contain biological resources outside of the rocket development areas. SSFL is near the crest of the Simi Hills, which are part of the Santa Monica Mountains running east-west across Southern California. The diverse terrain consists of ridges, canyons, and sandstone rock outcrops. NASA has conducted several surveys to identify biological resources within its portion of SSFL. As a result, NASA has identified special-status plant and animal species occurring on its property.

Previous environmental sampling on the NASA-administered property indicates that metals, dioxins, polychlorinated biphenyls (PCBs), volatile organics, and semivolatile organics are present in the soils and upper groundwater (known as the Surficial Media Operable Unit). Volatile organics, metals, and semivolatile organics also are present in the deeper groundwater (known as the Chatsworth Formation Operable Unit).

Environmental Commitments

Rocket engine testing has been discontinued at these sites and the property has been excessed to the General Services Administration (GSA). GSA conditionally has accepted the Report of Excess pending: (1) NASA's certification that action necessary to protect human health and the environment with respect to hazardous substances on the property has been taken or receipt of the U.S. Environmental Protection Agency's (EPA's) written concurrence that an approved and installed remedial design is operating properly and successfully; OR (2) the Governor's concurrence of the suitability of the property for transfer per Comprehensive Environmental Response, Compensation, and Liability Act Section 120(h)(3)(C).

In 2007, a Consent Order among NASA, Boeing, U.S. Department of Energy, and Department of Toxic Substances Control (DTSC) was signed addressing demolition of certain infrastructure and environmental cleanup of SSFL. NASA entered into an Administrative Order on Consent (AOC) for Remedial Action with DTSC on December 6, 2010, "to further define and make more specific NASA's obligations with respect to the cleanup of soils at the Site." On the basis of the 2010 AOC, NASA is required to complete a Federal environmental review pursuant to NEPA. An EIS is being prepared by NASA to include demolition of site infrastructure, soil cleanup and groundwater remediation within Area II and a portion of Area I (LOX Plant) of SSFL.

As part of the environmental review process, certain studies are being completed to characterize the existing conditions and to provide information for the analysis and consultation. These include surveys for wildlife, critical habitat, rare plants, wetlands, and archaeological resources. The findings of these studies will be incorporated into the EIS.

Environmental Analysis

NASA will submit a Biological Assessment (BA) based on the existing ecological resource surveys and the data collected during the biological resources studies. The BA will be prepared and submitted to the USFWS to support Section 7 Consultation. Best management practices, such as seasonal restrictions on the work, will be reviewed. CH2M HILL is NASA's contractor for this work and will work with NASA and the resource agencies to establish appropriate avoidance and minimization measures to reduce the impacts of the proposed action on known or potentially known sensitive habitats. In the event suitable habitat for listed species is identified in an inaccessible area of the proposed project area, listed species will be assumed to be present. The BA will address effects of the proposed action on federally listed threatened or endangered species known to occur or to have the potential to occur on the SSFL project area, including but not limited to, the following:

- Braunton's milk vetch (*Astragalus brauntonii*)
- *Dudleya* spp.
- Santa Susana tarplant (*Deinandra minthornii*)
- Quino checkerspot butterfly (*Euphydryas editha* ssp. *quino*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- California red-legged frog (*Rana aurora* ssp. *draytonii*)
- Least Bell's vireo (*Vireo bellii* ssp. *pusillus*)

In addition, potential Quino checkerspot butterfly habitat occurs on the site. The BA will include a focused survey of the NASA property for host plants that will identify the extent of the butterfly's preferred habitat.

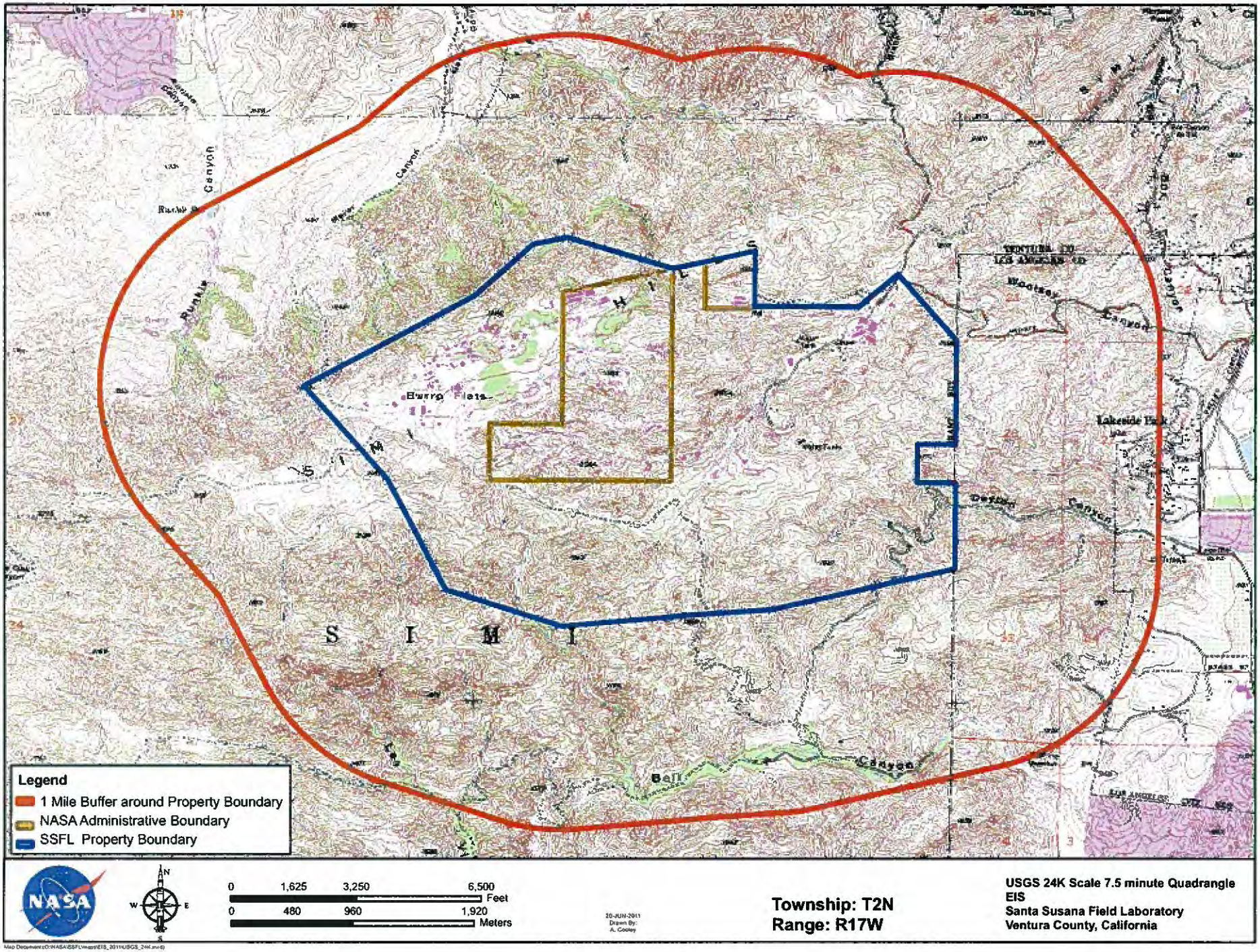
We look forward to working cooperatively with your agency to conduct these evaluations. If you have questions regarding these plans or to set up a meeting, please feel free to contact me at 256- 544-0662 or Amy Keith at 256-544-7434.

Sincerely,

Allen Elliott
SSFL Program Director

Enclosure – Site Map

cc:
AS10/Amy Keith
CH2M HILL/Beth Vaughan
CH2M HILL/Leslie Tice


Legend
1 Mile Buffer around Property Boundary
NASA Administrative Boundary
SSFL Property Boundary
S I M I
Burro Flats
Lakeside Park
Bell Canyon
0 1,625 3,250 6,500 Feet
0 480 960 1,920 Meters
20-JUN-2011
Drawn By:
A. Cooley
Township: T2N
Range: R17W
USGS 24K Scale 7.5 minute Quadrangle
EIS
Santa Susana Field Laboratory
Ventura County, California

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2011-CPA-0163

September 15, 2011

Allen Elliott
Marshall Space Flight Center
AS 01, Building 4494
Huntsville, Alabama 95812

Subject: Environmental Impact Statement Scoping Comments for the National Aeronautics and Space Administration's Environmental Cleanup of the Santa Susana Field Lab, Ventura County, California

Dear Mr. Elliott:

We are responding to the notice of intent to conduct scoping and prepare an Environmental Impact Statement (EIS) for Demolition and Environmental Cleanup Activities for the National Aeronautics and Space Administration (NASA) administered portion of the Santa Susana Field Laboratory (SSFL), posted in the Federal Register on July 6, 2011.

The U.S. Fish and Wildlife Service's (Service) responsibilities include administering the Endangered Species Act of 1973, as amended (Act), including sections 7, 9, and 10. Section 9 of the Act and its implementing regulations prohibit the taking of any federally listed endangered or threatened species. Section 3(19) of the Act defines take to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Service regulations (50 CFR 17.3) define harm to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harassment is defined by the Service as an intentional or negligent action that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. The Act provides for civil and criminal penalties for the unlawful taking of listed species. Exemptions to the prohibitions against take may be obtained through coordination with the Service in two ways: through interagency consultations for projects with Federal involvement pursuant to section 7 of the Act or through the issuance of an incidental take permit under section 10(a)(1)(B) of the Act.

The Migratory Bird Treaty Act (16 U.S.C. 703-712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing take, we recognize that some birds may be killed even if all reasonable measures to avoid it are implemented. The Service's Division of Law Enforcement carries out its mission to

protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals and industries that actively seek to eliminate their impacts on migratory birds. Although individuals or companies cannot be absolved from liability under the MBTA, if they work with the Service to minimize their impact, the Division of Law Enforcement and Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals or companies who have made good faith efforts to avoid the take of migratory birds.

The federally listed species presented below have the potential to occur within SSFL and associated undeveloped areas:

- Braunton's milkvetch (*Astragalus brauntonii*), Endangered, designated critical habitat onsite;
- Lyon's pentachaeta (*Pentachaeta lyonii*), Endangered;
- Riverside fairy shrimp (*Streptocephalus woottoni*), Endangered;
- Least Bell's Vireo (*Vireo bellii pusillus*), Endangered;
- Quino checkerspot butterfly (*Euphydryas editha quino*), Endangered;
- Coastal California gnatcatcher (*Polioptila californica californica*), Threatened;
- California red-legged frog (*Rana draytonii*), Threatened, designated critical habitat onsite;
- Vernal pool fairy shrimp (*Branchinecta lynchi*), Threatened;
- Spreading navarretia (*Navarretia fossalis*), Threatened;
- California Orcutt grass (*Orcuttia californica*), Threatened;
- Conejo dudleya (*Dudleya abramsii* subsp. *parva* [=*D. parva*]), Threatened;
- Santa Monica Mountains live-forever (*D. cymosa* subsp. *ovatifolia* [inclusive of *D. cymosa* subsp. *agourensis*]), Threatened; and
- Marcescent dudleya (*D. cymosa* subsp. *marcescens*), Threatened.

The EIS should include a description of the potential for listed species and critical habitats to be present within NASA's portion of the SSFL, as well as a description of how these species and habitats may be impacted by the proposed demolition and cleanup activities. We would like to stress the importance of early coordination between NASA and the Service during the planning phase for demolition and cleanup activities. As described above, it is NASA's responsibility under the Act to initiate consultation with the Service to analyze the effects of the proposed project on federally listed species. Early coordination would allow NASA and the Service to identify measures that will minimize the effect of the cleanup on federally listed species, and to ensure adequate time for both parties to complete the consultation process.

In addition to addressing impacts to endangered and threatened species, the EIS should also identify any potential adverse effects to migratory birds, which are protected under the MBTA. Of particular interest to the Service is identifying whether any of the structures slated for demolition provide nesting habitat for migratory birds. The Service is available to discuss measures for minimizing impacts, such as scheduling the timing of demolition to occur outside

season in order to avoid killing or injuring eggs, juvenile, or adult birds that are utilizing the derelict structures.

Because NASA, Boeing and the Department of Energy (DOE) are proceeding with cleanup planning and implementation for their respective areas of SSFL somewhat independently from each other, the staff time required by the Service to track progress and provide information about compliance with laws protecting federally listed species is unusually high. The Service is interested in engaging with NASA to provide guidance on evaluating risk to federally listed species and migratory birds to ensure that the project actions and eventual remedy are protective of Service trust resources. We request a meeting or conference call with NASA to discuss how to efficiently coordinate with you and the other involved agencies during the cleanup of this site.

We appreciate the opportunity to provide scoping comments for NASA's EIR. If you have questions about these comments, please contact Jenny Marek of our staff at (805) 644-1766 ext. 325 or by email at Jenny_Marek@fws.gov.

Sincerely,

Diane K. Noda
Field Supervisor

Cc:

Shawn Alam, U.S. Department of the Interior
Mary Meyer, California Department of Fish and Game

This page intentionally left blank.

MEETING SUMMARY

Santa Susana Field Laboratory–EIS

NASA, USFWS, and CDFG Coordination Meeting

ATTENDEES:	Amy Keith/NASA	Mary Meyers/CDFG
	Jeremiah Kolb/NASA	Gary Santolo/CH2M HILL
	Jenny Marek/USFWS	Leslie Tice/CH2M HILL
COPIES:	Allen Elliott/NASA	
	Tina Norwood/NASA	
	Beth Vaughan/CH2M HILL	
FROM:	CH2M HILL	
DATE:	December 1, 2011	
ATTACHMENT:	USFWS-CDFG_Information Packet_Dec2011.PDF	

Meeting Objectives

- Initiate informal consultation about the Santa Susana Field Laboratory (SSFL) Environmental Impact Statement (EIS) and develop a dialogue and plan for successfully completing Section 7 activities associated with the NASA EIS.
- Review survey findings, status of the analysis, and schedule for completing Section 7 compliance.
- Add to the schedule when the appropriate time is to initiate formal Section 7 consultation.
- Jenny Marek and Mary Meyers both asked to get a better understanding of how the NASA EIS relates to other activities on SSFL by NASA, Boeing, U.S. Department of Energy (DOE), and the State of California Department of Toxic Substances Control (DTSC).

Project Overview

Leslie Tice provided a project overview including a description of the NASA-administered property at SSFL, a review of the proposed demolition and environmental cleanup activities including the four action alternatives, and the NEPA triggers for the project. Leslie also reviewed the project schedule including completed and ongoing scoping and impact analysis activities, the upcoming wetlands delineation and report, the Quino checkerspot butterfly habitat survey, and the Biological Assessment (BA). The Draft EIS currently is scheduled to be released for public review in the summer of 2012 and NASA's goal is to finalize the EIS by the end of 2012, with a Record of Decision signed in early 2013. With this, NASA is looking to receive a Biological Opinion (BO) from USFWS about the time that the EIS is finalized.

Survey Overview and Findings Discussion

Gary Santolo discussed the methodology, schedule, and findings of past biological surveys on the NASA property including habitat and wildlife surveys and protocol-level rare plant surveys. This overview is provided in the attached meeting Informational Packet. Gary also discussed remaining surveys to be completed, including a wetlands delineation scheduled for the first week of January 2012 and a Quino checkerspot butterfly habitat survey scheduled for the spring of 2012.

Tarja Sagar/NPS was involved in the rare plant identifications and Dr. Dick Arnold will conduct the butterfly survey.

Gary confirmed that no California Red Legged Frogs (CRLFs) have been identified during the surveys. Jenny asked if a CRLF habitat survey will be completed since no CRLF-specific surveys have been conducted at SSFL. Gary

suggested that this be completed during the wetlands delineation. This would be a good piece of information to identify if any additional surveys would be needed. Jeremiah Kolb shared the CRLF survey completed by DOE.

Gary also confirmed that opportunistic dipnet sampling in lieu of protocol-level survey would occur during the wetlands delineation to look for two species of sensitive fairy shrimp. Jenny agreed that protocol-level fairy shrimp surveys are not necessary at this time because these areas are not anticipated to be affected by the proposed activities. Jenny requested that the dipnet surveys include an open consideration of invertebrates, not only the fairy shrimp. Gary agreed this could be done.

Jenny confirmed that although it is unlikely that the Quino checkerspot is present, she would like the habitat survey to be completed so that it can be documented adequately.

Mary Meyers requested that although Braunton's milk vetch was not found on the NASA property, the lack of habitat would be better justified based on whether the soil type found where the offsite milk vetch was located differs from soils found onsite. CH2M HILL will look at the NRDC data and update its findings.

Mary asked that bryophytes in the rock outcrops be considered. Amy Keith confirmed after the meeting with Allen Elliott that rock outcrops will not be affected. With small areas of exception, the estimated areas of contamination do not overlay the rock outcrops. It is expected that areas can be treated with alternative, less-invasive cleanup technologies. This will be considered in the environmental review. Both Jenny and Mary had concerns about the use of the term "Natural Resources Management Plan (NRMP)." Mary noted that since there are no management measures, it should not be called a Management Plan. Jenny noted that typically, an NRMP developed for a military installation requires review, concurrence, and signature by the USFWS. Jeremiah confirmed after the meeting that the document will be used as a management tool; however, the name of the document will be changed to an Ecological Stewardship Plan.

Mary noted, and Jenny agreed, that while the tarplant is prevalent on the NASA property, it is a species of concern and could be listed during the life of the project; therefore, it should be protected. CH2M HILL agreed to look into whether the tarplant is as prevalent outside of the SSFL boundaries. Mary added that Boeing is working to avoid all tarplants. Leslie shared a comment brought up by CNPS (Betsey Landis) during the scoping period – identify and protect large populations of the tarplant in upland areas. Therefore, if NASA removes lowland populations, the species naturally will repopulate. Mary added that it might be a good idea to consult with Betsey Landis/CNPS in the mitigation development process.

Gary confirmed that no habitat for the threatened Coastal California gnatcatcher was identified.

Gary confirmed that no nests were found for the least Bell's vireo. Jenny added that USFWS is still concerned that habitat might be possible in this area. The level of impact is dependent on the level of riparian impacts.

Jenny confirmed that migration corridors will be considered in the EIS.

Jenny and Mary both agreed that development of a restoration plan as a form of mitigation is a good idea. NASA might consider coordinating with Boeing and DOE to consider what species should be included, what impacts are anticipated, what others are finding, and what mutual restoration actions could best benefit the species and ecosystem.

Other Discussions

Additional discussion involved mapping the extent of the 2005 fire or any recent fires. A map may help us understand if the fire disturbances helped or hurt species propagation.

Jenny asked how NASA is planning on handling the fugitive emissions from all the anticipated excavation work beyond the typical use of water trucks. Leslie confirmed this would be considered in the EIS and stated that NASA is completing a general conformity analysis, which considers all project emissions including fugitive dust. Mitigations will have to consider if soils will be staged for extended periods of time.

DTSC Coordination–Jenny and Mary have both been in communication with DTSC (Brian Fockner) about SSFL activities. Jenny stated that DTSC will be scheduling a meeting with USFWS, CDFG, and SSFL land owners and

tenants in January 2012 to discuss activities and how coordinated efforts could take place. A specific date has not been set. Jenny noted Allen Elliott's name as the NASA point of contact.

Timeline for the Biological Assessment–Leslie provided the initial schedule for the BA development. Jenny added that she had not yet received a request for a species list, which is needed to initiate consultation. Jeremiah agreed to submit this information. Jenny added that the BA should not be submitted until all information is in (specifically the findings of the Quino Checkerspot Butterfly habitat survey). Furthermore, Jenny said that because the BA will only discuss the proposed action, if there is any chance that the proposed action could change or aspects of the project might change, she suggests not submitting until this is final. In other words, it might be worth holding off on submittal until after the Draft EIS is through public review. Leslie asked if the BA is submitted for the proposed action and the ultimate action is a lower level of impact, would the BO stand. Jenny confirmed that the BO would stand; however, NASA would have to uphold the higher level of mitigation agreed to in the BO. Leslie and Amy said they would discuss these options with the team and refine the schedule.

Jenny offered to share the USFWS Ventura Field Office template for the BA.

Timeline for Section 7 Consultation–

- NASA will send a formal request for a species list. USFWS will respond with this list and informal consultation will begin.
- NASA will make a determination of effect after all findings are in. NASA will send a letter to USFWS for concurrence. If it is a "May Adversely Affect" finding, a BA will be necessary.
- Once the remaining surveys are complete (~March 2012), NASA will send USFWS a letter requesting formal consultation.

Permit Requirements–

- NASA is anticipating preparing a BA and may need to get an Incidental Take Permit from USFWS if it is determined that take of a protected species may occur.
- On the basis of the upcoming wetlands delineation, NASA might require a Section 404 permit for impacts to wetlands or waters of the U.S.
- Mary confirmed that NASA likely will be exempt from the 1600 permit for streambed alteration because activities are on federal land. Mary will confirm after the January DTSC meeting. If this is needed, CDFG cannot issue the permit until DTSC completes their CEQA.

Future Coordination and Consultation–The group confirmed that NASA will coordinate directly with USFWS for this project. CDFG will be part of the public review process and through DTSC coordination, as appropriate. After the January meeting with DTSC, Leslie will check with Jenny for a download and to set up the next coordination meeting.

Natural Resources Damage Assessment (NRDA)–Jenny provided a general overview of an NRDA and added that this is a topic of discussion for the January 2012 meeting. The objective is to look at collective damage that might have occurred since 1980 from past activities, as well as potential damage from proposed activities. USFWS then works with the agencies to develop appropriate mitigation measures to restore the natural environment. Jenny added that it is possible to use the EIS as a mechanism to employ these mitigations if the NRDA is not found to be advantageous to the USFWS. Jenny also added that the NRDA process occurs parallel to other activities and should not delay the NEPA or other environmental review processes.

Action Items

- CH2M HILL will include a CRLF habitat survey during the wetlands delineation.
- Based on the meeting discussion, CH2M HILL checked the soil type in the area where the Braunton's milk vetch was located. It was found that Gaviota rocky sandy loam soils underlies the identified milk vetch

location. This is the same soil type found in the northeastern portion of Area II and in southern portion of LOX Area I. This will be considered in the biological study.

- Based on the meeting discussion, Amy Keith verified that rock outcrops on the NASA-administered property would be avoided.
- Amy will coordinate with DOE re: radionuclide testing at SSFL including on the NASA property.
- Jeremiah will send USFWS a request for a species list to initiate informal consultation.
- Subsequent to this meeting, Jenny Marek sent Gary Santolo the USFWS Ventura Field Office template for the BA.
- Leslie Tice will set up the next Section 7 coordination meeting after the January DTSC meeting.

Attachment
Informational Packet

This page intentionally left blank.

Environmental Impact Statement and Section 7 Consultation Information Packet for the Proposed NASA Environmental Cleanup Activities and Demolition at Santa Susana Field Laboratory, Ventura County, California

Project Overview

The National Aeronautics and Space Administration (NASA) is preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) to evaluate the proposed environmental cleanup and demolition activities at the Santa Susana Field Laboratory (SSFL) in Ventura County, California. Preparation of an EIS will meet the NEPA obligations of the Administrative Order on Consent (AOC) signed with the Department of Toxic Substances Control. As part of the environmental review process, NASA is initiating informal consultation with the U.S. Fish and Wildlife Service and California Department of Fish and Game.

Four project action alternatives and the no action alternative are considered in the EIS:

- Cleanup of Soils to Background Levels (Proposed Action)
- Cleanup of Soils to Suburban Residential Cleanup Goals
- Cleanup of Soils to Commercial/Industrial Cleanup Goals
- Cleanup of Soils to Recreational Cleanup Goals

Each of these action alternatives also considers groundwater remediation and the demolition of up to 100 percent of the structures on the NASA-administered property at SSFL. The purpose of this action is to support property disposition.

Overview of Surveys Conducted

NASA's involvement with biological surveys began in 2008 with site-specific surveys to support remedial investigations and ecological risk assessments for NASA–administered sites at SSFL. General plant and wildlife lists from opportunistic observations were created at this time.

In 2010, NASA updated habitat mapping and assessed the potential for rare plants and wildlife to occur on the entire NASA-administered property at SSFL in support of a draft Natural Resource Management Plan. This habitat mapping and wildlife survey was conducted in the fall (late September-early October). Global positioning system (GPS) mapping of more than 3,600 Santa Susana tarplant locations was completed at that time.

The fall 2010 summary report recognized that many of the plants had senesced, indicating that the rare plant surveys should be conducted the following year at times that would be expected to give the most complete understanding of the range of plants potentially occurring at SSFL. It also was recognized that additional wildlife surveys during these different times of the year would provide a greater understanding of the range of wildlife use of SSFL.

Therefore, additional surveys were planned in 2011 that would: 1) assess the potential for rare plants; 2) develop a more complete inventory of listed and non-listed wildlife at SSFL; and 3) fully characterize wetlands and waters on the NASA-administered property. At this point, the first two items have been addressed while the third item (wetlands) will be completed in the winter of 2011/2012. Three week-long surveys were completed in 2011 in April, June, and August to document the flora and fauna on NASA-administered property.

Species of Concern

The following federally listed threatened or endangered species are known to occur or have the potential to occur on the SSFL project area:

Braunton's milk vetch (*Astragalus brauntonii*)

This plant was observed at a reference location that occurs on the Boeing property at SSFL during all of the site visits. However, this plant was not detected at any location of the NASA-administered property. Note that the CNDDB Occurrence No. 7, shown on Figure 4, was based upon non-specific site location information that did not match the terrain around Skyline Drive where the coordinates fell. The CNDDB location detail states that the "exact location of Silvernale Ranch is unknown. The species is mapped near Burro Flats, which is presumed to be "open fields" referred to by Koppler. It is likely that the CNDDB staff made their best guess as to where this plant might be and that the reference population we have been using – located slightly to the south of Burro Flats may be closer to the actual location.

Dudleya spp.

There was concern that one of the two species observed in the early surveys potentially could be one of the listed Dudleya spp. known to occur in the general vicinity of SSFL. It was only during the June survey (when the plants were flowering) that it was decided, in conjunction with a National Park Service botanist, Tarja Sagar, that the non-chalky species observed onsite was *D. lanceolata* and not one of the listed species. Four offsite Dudleya spp. reference sites were visited during the June survey to help assess interspecies variability and field characteristics.

Santa Susana tarplant (*Deinandra minthornii*)

More than 3,600 locations of these plants were documented by GPS within the NASA-administered property at SSFL during the fall 2010 habitat survey; no additional work was done for this species in 2011.

Quino checkerspot butterfly (*Euphydryas editha* ssp. *quino*)

A possible (unconfirmed) sighting of this butterfly occurred during the fall 2010 survey. The conclusion was that the habitat for this species is only marginally suitable and the likelihood of occurrence is low. Dr. Dick Arnold, an accredited entomology expert in this species, has been engaged to assess habitat conditions in the NASA-administered property at SSFL and the potential for the butterfly to occur in these areas. Dr. Arnold's habitat survey tentatively is scheduled for February/March 2012 when the butterfly's food plants are expected to be in bloom.

Riverside fairy shrimp (*Streptocephalus woottonii*) & Vernal pool fairy shrimp (*Branchinecta lynchi*)

Most of the sandstone basins occur near topographic high points associated with the sandstone formations. The potential occurrence of both of these shrimp species was assessed by opportunistic surveys for the small sandstone basins that have been mapped on the NASA-administered property at SSFL. Each pool was revisited during each site visit and, if the pool contained water, then a close visual inspection and dip-netting were conducted to assess the potential occurrence of these shrimp. Protocol-level surveys were not completed because there currently are no anticipated impacts that will occur in these areas from the proposed remedial activities.

California red-legged frog (*Rana aurora* ssp. *draytonii*)

There are three potential locations on the NASA-administered property at SSFL where this species might occur–a pond in the northwestern corner of Area 1 and two stormwater detention ponds (R-9 Pond and Coca Detention Pond). This species was not observed during opportunistic surveys at any of the three locations.

Least Bell's vireo (*Vireo bellii* ssp. *pusillus*)

The least Bell's vireo was sighted in coyote brush adjacent to the oak woodland west of the Ash Pile. It was observed during the August 2011 survey, after the typical breeding period (April 10 to July 31), and might have been a transient bird moving through the study area. Mule fat, a favored plant of the least Bell's vireo, was present in the survey area; however, the vegetation in the area was predominantly fragmented and open, with only limited areas containing an upper canopy. Habitat fragmentation detracts from the overall habitat quality in the study area. No Bell's vireos were observed or heard while surveys were being conducted during their breeding period.

This page intentionally left blank.

Figures

This page intentionally left blank.

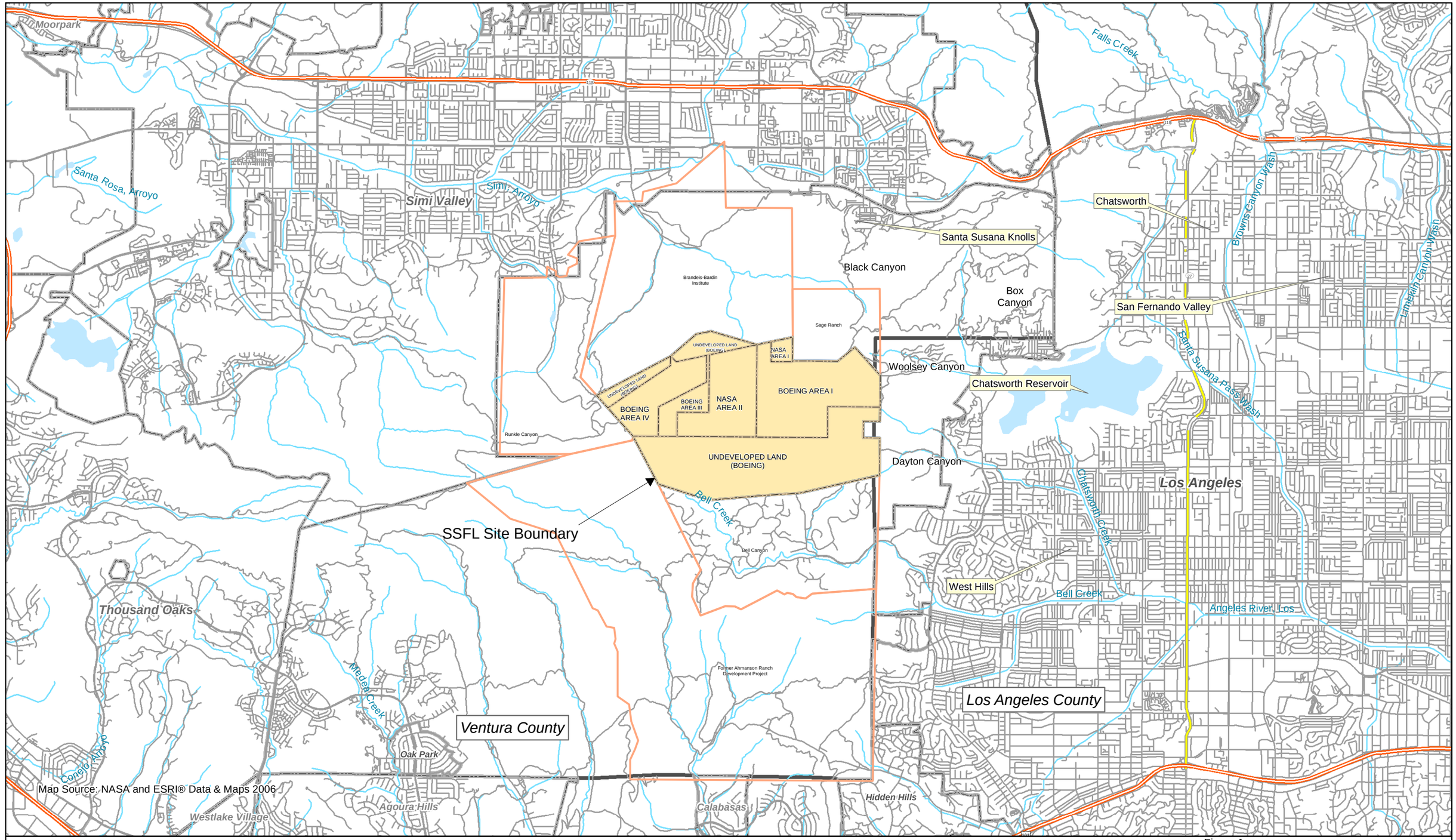
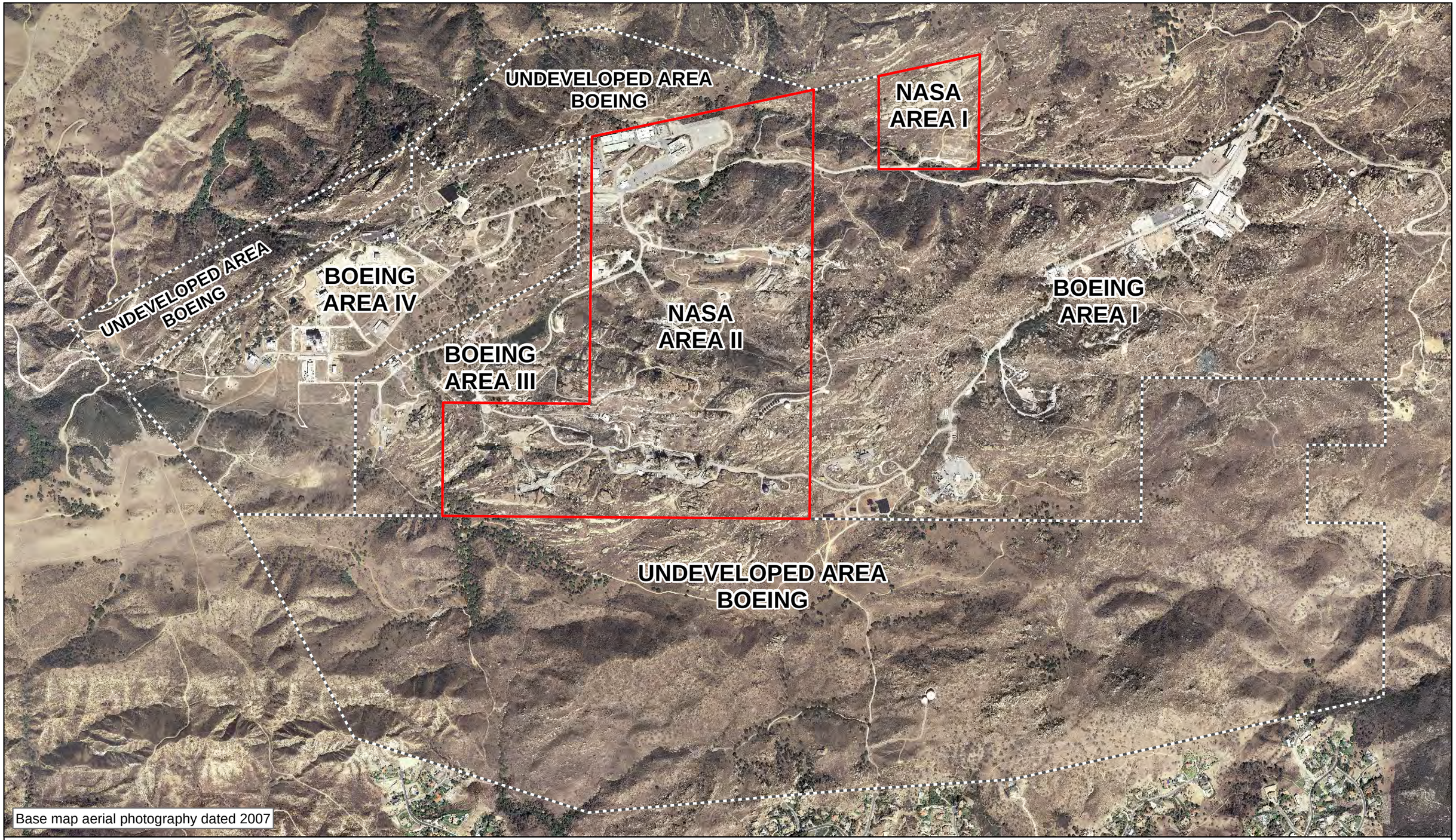


Figure 1
Regional Map
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_Regional_V2.mxd



02-Nov-2011
Drawn By:
A. Cooley

0 750 1,500 3,000 Feet

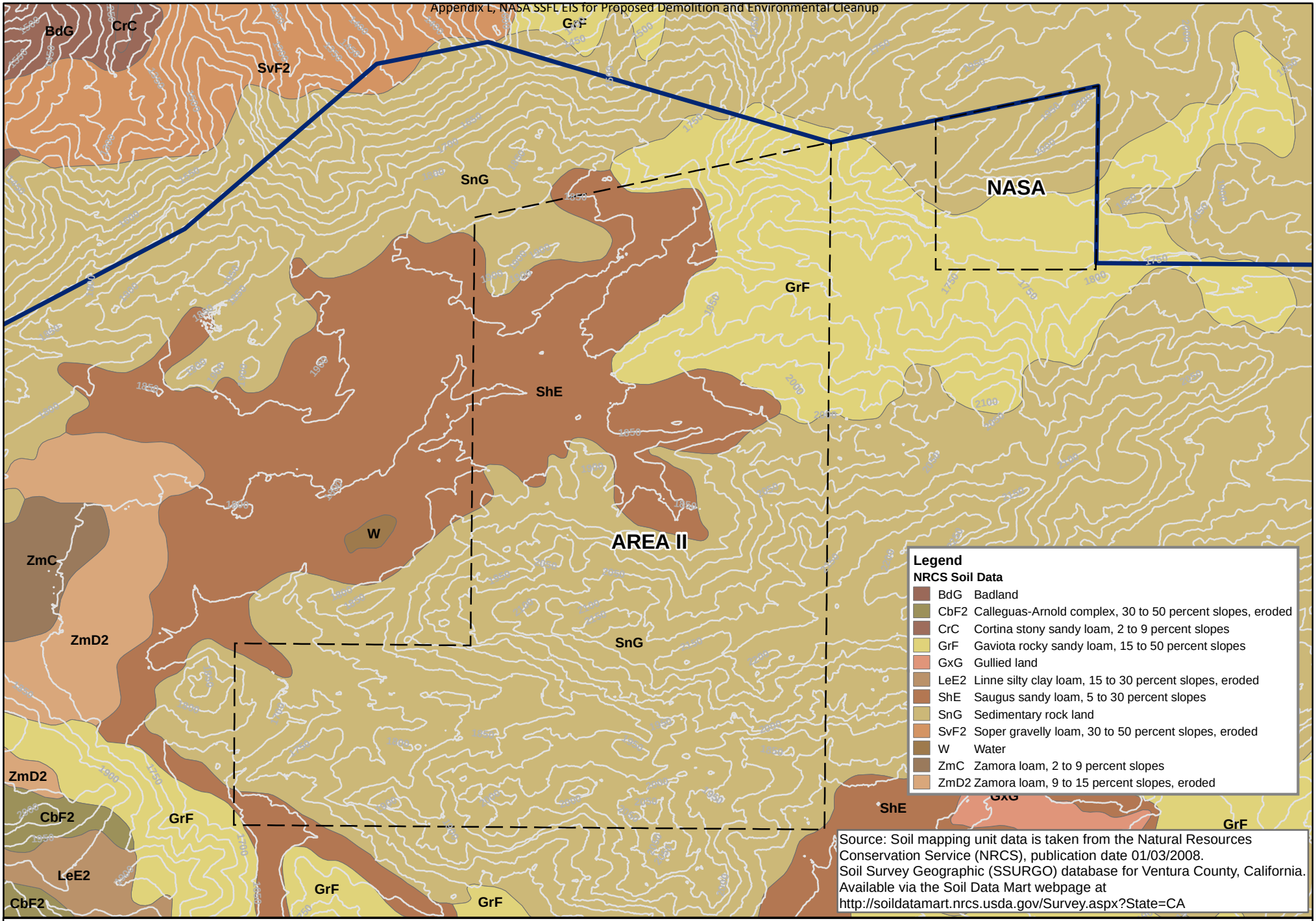
Legend

- NASA Property Boundary
- Administrative Area

DRAFT

Figure 2
Site Overview
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_Site_Overview_SDE_V2.mxd



0 500 1,000 Feet
0 150 300 Meters

02-Nov-2011
Drawn By:
A. Cooley

DRAFT

Figure 3
NRCS Soil Mapping
NASA Supplemental Biological Survey - 2011
Santa Susana Field Laboratory
Ventura County, California

Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\BioSvy_Spring2011_NRCS_V2.mxd

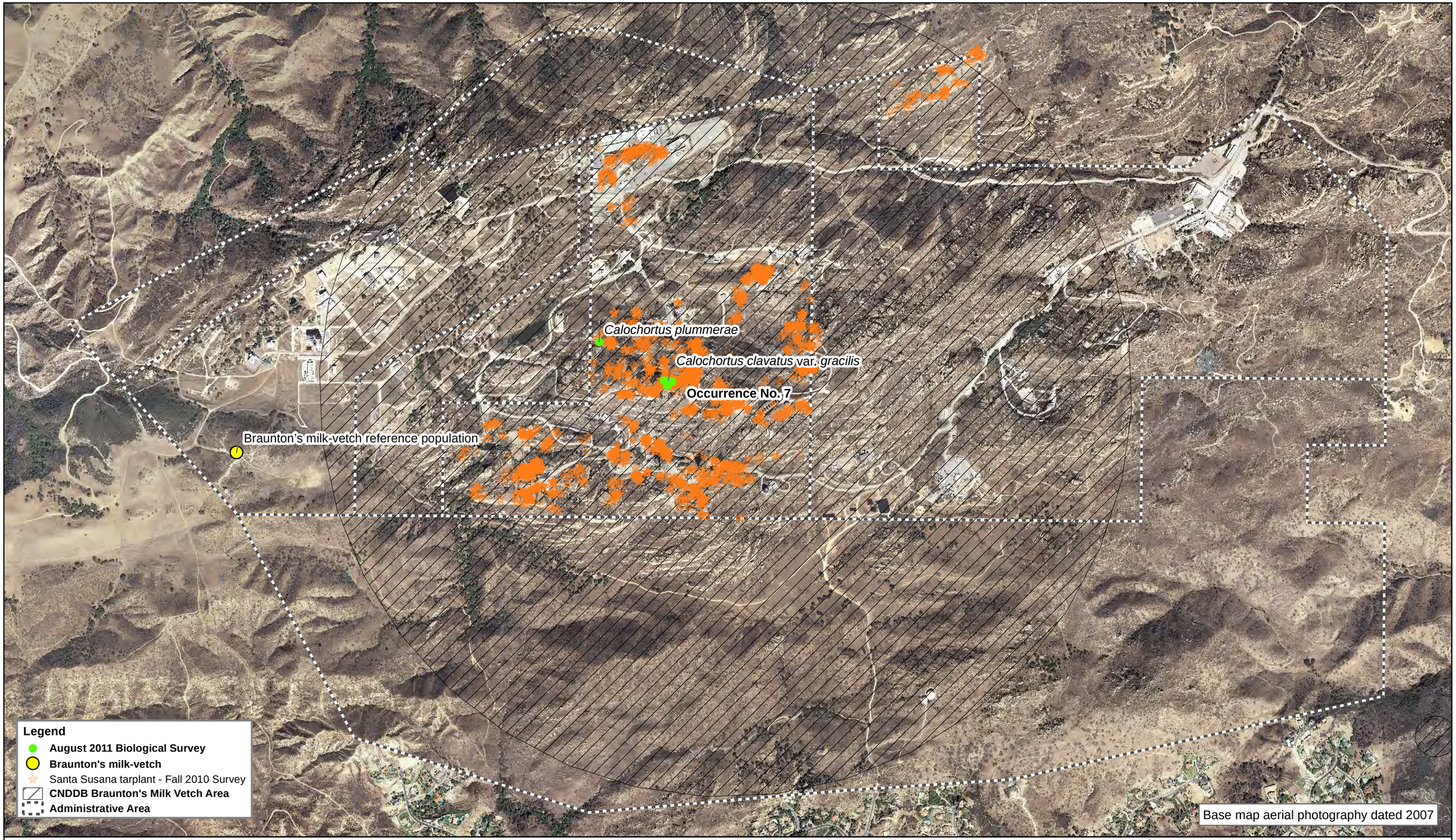
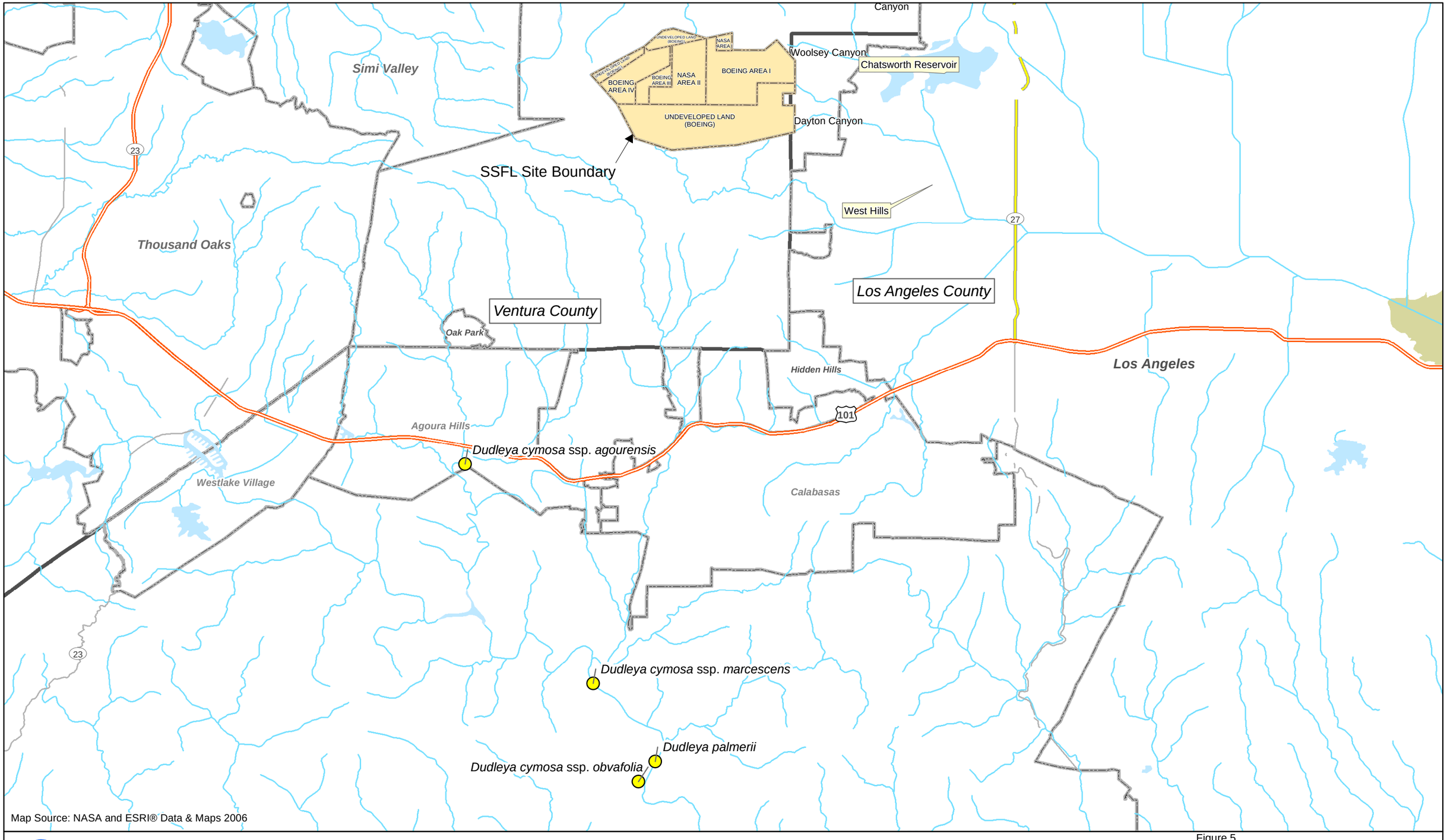


Figure 4
Rare Plant and Reference Site Locations
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_SuppBioSvy_RarePlant_SDE_V2.mxd



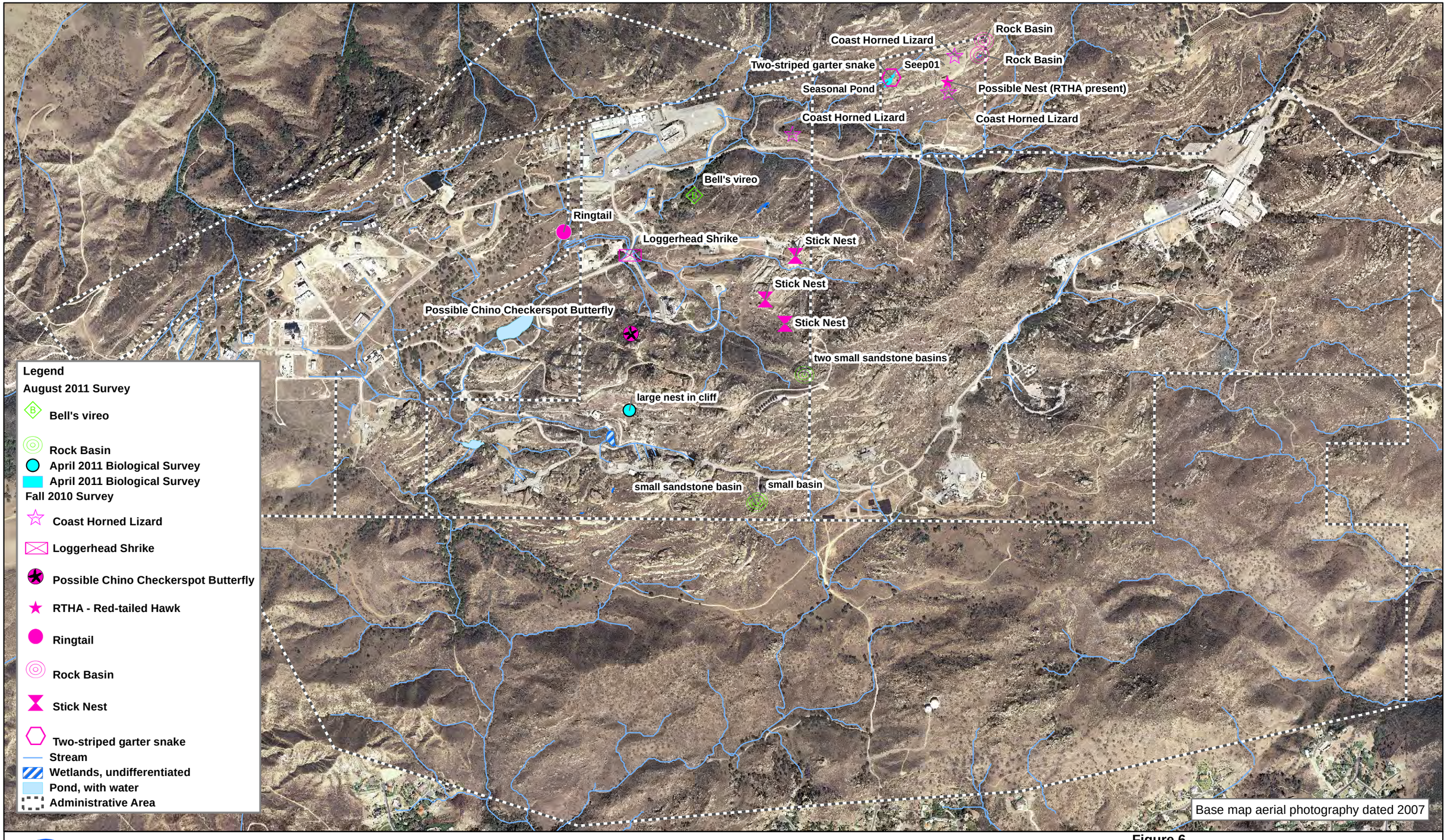
0 0.5 1 2 Miles
0 0.75 1.5 3 Kilometers

02-Nov-2011
Drawn By:
A. Cooley

DRAFT

Figure 5
Dudleya spp. Reference Locations
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_SuppBioSvy_DudleyaReference2_SDE_V2.mxd



0 750 1,500 3,000 Feet

0 250 500 1,000 Meters

02-Nov-2011
Drawn By:
A. Cooley

DRAFT

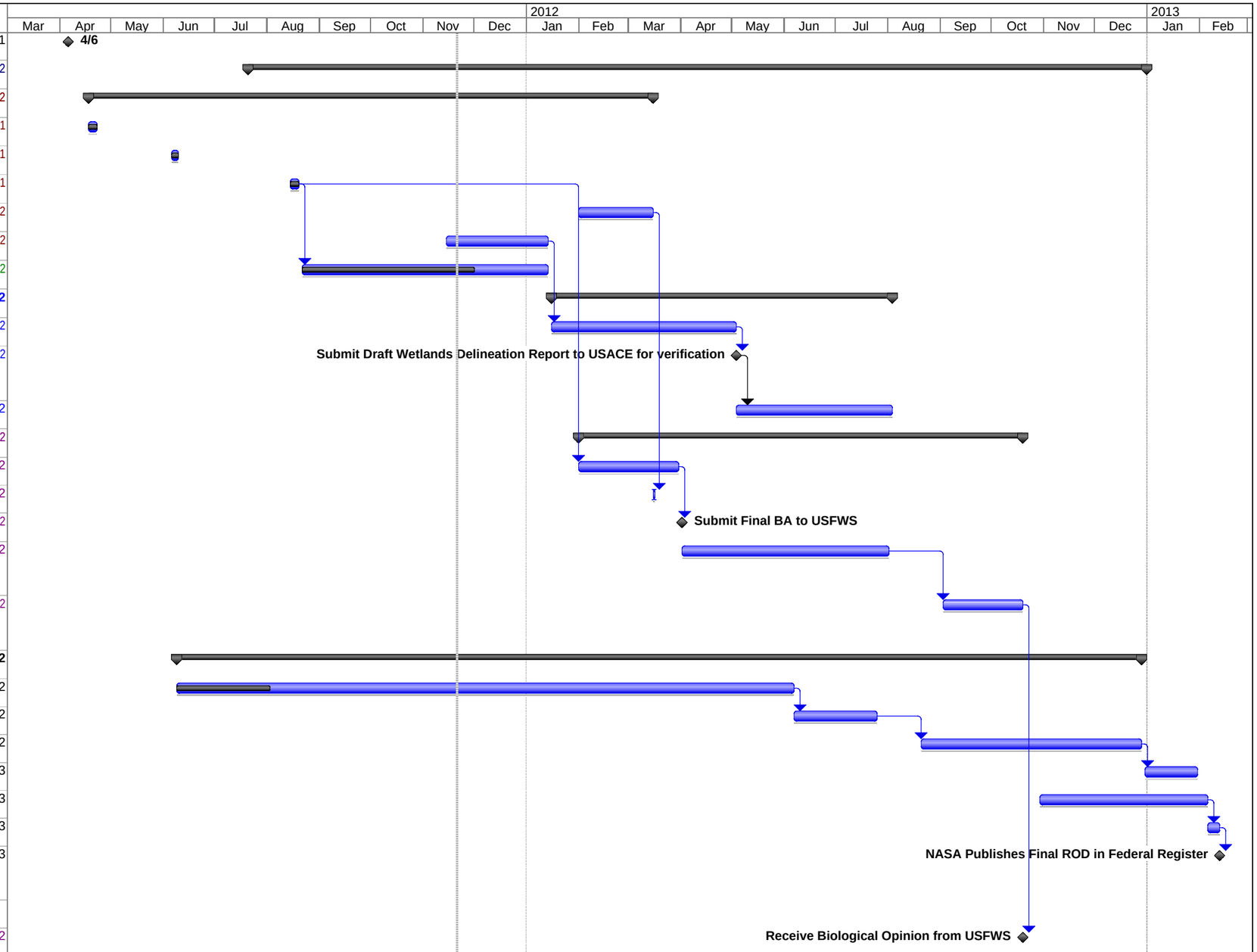
Figure 6
Significant Wildlife Observations
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_SuppBioSvy_Wildlife_V2.mxd

Schedule

This page intentionally left blank.

ID	Task Name	Start	Finish
1	Notice to Proceed	Wed 4/6/11	Wed 4/6/11
2	Agency Consultations	Thu 7/21/11	Mon 12/31/12
9	Biological Surveys	Mon 4/18/11	Thu 3/15/12
10	Rare Plant and Wildlife Survey (early blooming season)	Mon 4/18/11	Fri 4/22/11
11	Rare Plant and Wildlife Survey (mid-blooming season)	Mon 6/6/11	Thu 6/9/11
12	Rare Plant and Wildlife Survey (late blooming season)	Mon 8/15/11	Fri 8/19/11
13	Invertebrate Survey	Wed 2/1/12	Thu 3/15/12
14	Wetlands Delineation (and Vernal Pool/Fairy shrimp)	Tue 11/15/11	Fri 1/13/12
15	Prepare Supplemental Biological Survey Report	Mon 8/22/11	Fri 1/13/12
16	**Wetlands Delineation**	**Mon 1/16/12**	**Fri 8/3/12**
17	Prepare Draft Wetlands Delineation Report	Mon 1/16/12	Thu 5/3/12
18	Submit Draft Wetlands Delineation Report to USACE for verification	Fri 5/4/12	Fri 5/4/12
19	Receive Wetlands Delineation Concurrence	Fri 5/4/12	Fri 8/3/12
20	Biological Assessment	Wed 2/1/12	Fri 10/19/12
21	Prepare Biological Assessment	Wed 2/1/12	Fri 3/30/12
22	Insert Butterflly data	Fri 3/16/12	Fri 3/16/12
23	Submit Final BA to USFWS	Mon 4/2/12	Mon 4/2/12
24	USFWS Review Period (30 completeness review, 90 day review)	Mon 4/2/12	Wed 8/1/12
25	Receive Biological Opinion from USFWS (45 days; need before ROD signed)	Mon 9/3/12	Fri 10/19/12
26	**Prepare EIS**	**Thu 6/9/11**	**Fri 12/28/12**
27	Prepare Draft EIS	Thu 6/9/11	Wed 6/6/12
28	45-day Public Comment Period	Thu 6/7/12	Wed 7/25/12
29	Prepare Final EIS	Tue 8/21/12	Fri 12/28/12
30	30- Day Waiting Period Before ROD Can Be Signed	Mon 12/31/12	Wed 1/30/13
31	Prepare Record of Decision	Tue 10/30/12	Tue 2/5/13
32	ROD Signed	Wed 2/6/13	Tue 2/12/13
33	NASA Publishes Final ROD in Federal Register	Wed 2/13/13	Wed 2/13/13
34			
35	Receive Biological Opinion from USFWS	Fri 10/19/12	Fri 10/19/12



Schedule is current as of December 1, 2012

Project: SSFL-Schedule-29April2011
Date: Mon 11/21/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

December 21, 2011

Reply to Attn of: Office of Center Operations

U.S. Fish and Wildlife Service, Ventura Field Office
2493 Portola Road, Suite B
Ventura, California 93003
(805) 644-1766 ext. 325
Attn: Jenny Marek

Subject: Request for Listed Species and Critical Habitat for the NASA-administered property at Santa Susana Field Laboratory in Ventura County, California

Dear Ms. Marek,

The National Aeronautics and Space Administration (NASA) would like to officially request a list of any threatened and endangered or proposed threatened and endangered species, as well as any designated or proposed critical habitat that may be known to occur within the NASA-administered property at Santa Susana Field Laboratory (SSFL). SSFL is located 30 miles northwest of downtown Los Angeles in southeastern Ventura County, near the crest of the Simi Hills at the western border of the San Fernando Valley. The NASA-administered property at SSFL consists of 41.7 acres within Area I and all 409.5 acres of Area II. Attached is a map showing NASA-administered portion of SSFL. If you have any questions regarding this, please contact Jeremiah Kolb at 256-544-6304.

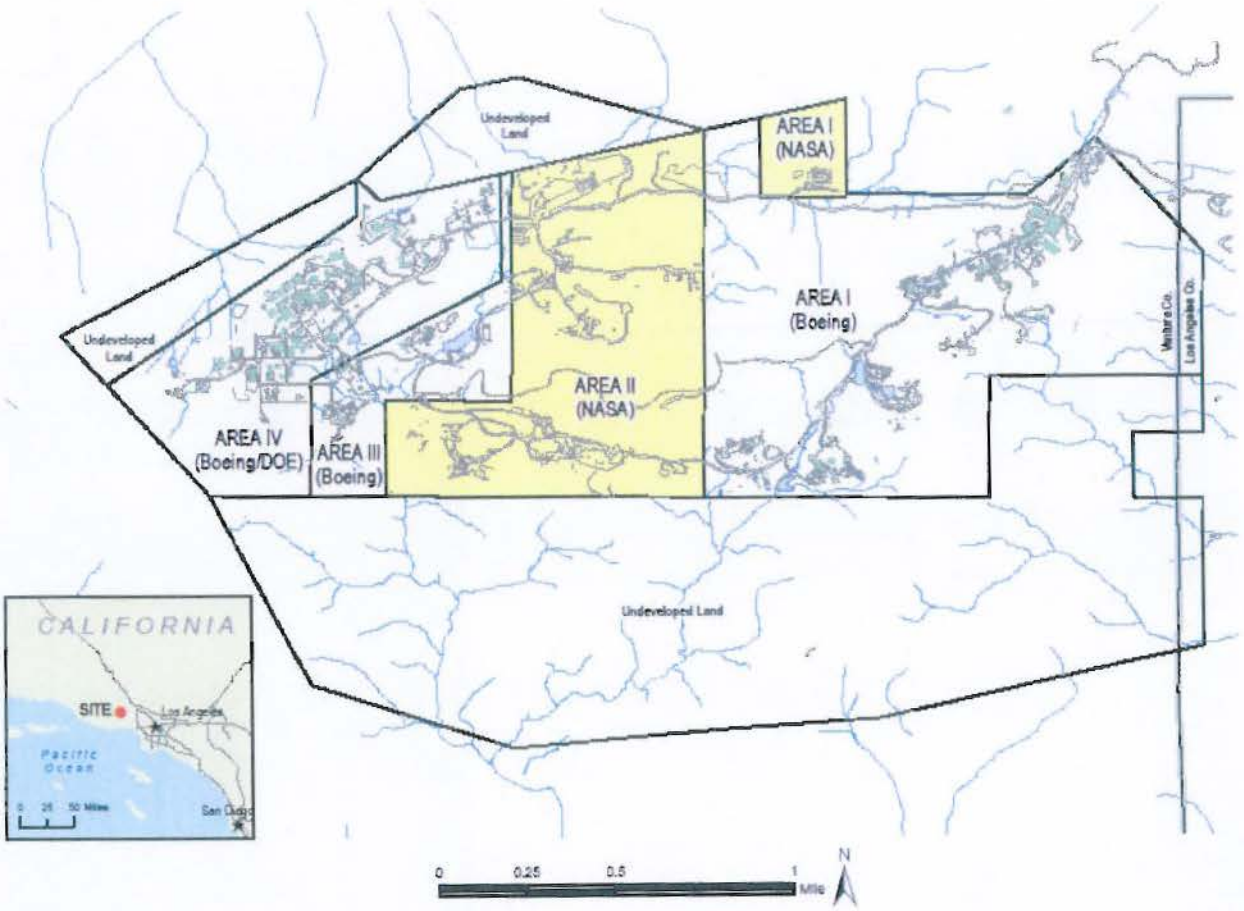
Sincerely,

Allen Elliott

Allen Elliott
SSFL Project Director
National Aeronautics and Space Administration (NASA)

Attachment: NASA-administered property map

cc: Mary Meyers, CDFG
Leslie Tice, CH2MHill


Undeveloped Land
AREA I (NASA)
AREA I (Boeing)
Undeveloped Land
AREA II (NASA)
AREA IV (Boeing/DOE)
AREA III (Boeing)
Undeveloped Land
Ventura Co.
Los Angeles Co.
CALIFORNIA
SITE
Los Angeles
Pacific Ocean
San Diego
0 25 50 Miles
0 0.25 0.5 1 Mile
N

Attachment

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2012-SL-0119

January 6, 2012

Allen Elliott, SSFL Project Director
Office of Center Operations
National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

Subject: Species List for the NASA-administered property at the Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Elliott:

We are responding to your request dated December 21, 2011 and received in our office on December 27, 2011 for information on listed species and critical habitat that may occur at or near portions of Santa Susana Field Lab (SSFL) that are administered by the National Aeronautics and Space Administration (NASA). SSFL was developed as a remote site to test rocket engines and conduct nuclear research, and is comprised of four administrative areas and two undeveloped land areas. NASA-administered property at SSFL consists of 41.7 acres within Area I and all 409.5 acres of Area II.

The U.S. Fish and Wildlife Service's (Service) responsibilities include administering the Endangered Species Act of 1973, as amended (Act), including sections 7, 9, and 10. Section 9 of the Act prohibits the taking of any federally listed endangered or threatened species. Section 3(19) of the Act defines take to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Service regulations (50 CFR 17.3) define harm to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harassment is defined by the Service as an intentional or negligent action that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. The Act provides for civil and criminal penalties for the unlawful taking of listed species.

NASA, as the lead Federal agency for the project, has the responsibility to review its proposed activities and determine whether any listed species or critical habitat may be affected. If the subject project may affect a listed species, NASA must consult with the Service, pursuant to section 7(a)(2) of the Act. During the consultation process, NASA may engage in planning

efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

The enclosed list of species fulfills the requirements of the Service under section 7(c) of the Act. Only listed species receive protection under the Act; however, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Game's Natural Diversity Data Base. You can contact the California Department of Fish and Game at (916) 324-3812 for information on other sensitive species that may occur in this area.

If you have any questions regarding this matter, please contact Jenny Marek of our staff at (805) 644-1766, extensions 325.

Sincerely,

Jeff Phillips
Deputy Assistant Field Supervisor

cc:
Mary Meyer, California Department of Fish and Game
Stephie Jennings, Department of Energy

LISTED SPECIES WHICH MAY OCCUR NEAR AREA I AND II OF THE SANTA SUSANA FIELD LAB, VENTURA COUNTY, CALIFORNIA

Plants		
Braunton's milk-vetch	*Astragalus brauntonii*	E
Lyon's pentachaeta	*Pentachaeta lyonii*	E
Spreading navarretia	*Navarretia fossalis*	T
Conejo dudleya	*Dudleya abramsii* ssp. *parva* [*Dudleya parva*]	T
Santa Monica Mountains dudleya	*Dudleya cymosa* ssp. *ovatifolia* [inclusive of *Dudleya cymosa* ssp. *agourensis*]	T
Marcescent dudleya	*Dudleya cymosa* ssp. *marcescens*	T
California Orcutt grass	*Orcuttia californica*	T
San Fernando Valley spineflower	*Chorizanthe parryi* var. f*ernandina*	C
Birds		
Coastal California gnatcatcher	*Polioptila californica californica*	T
Least Bell's vireo	*Vireo bellii pusillus*	E
Amphibians		
California red-legged frog	*Rana draytonii*	T
Invertebrates		
Quino checkerspot butterfly	*Euphydryas editha quino*	E
Vernal pool fairy shrimp	*Branchinecta lynchi*	T
Riverside fairy shrimp	*Streptocephalus woottoni*	E

Key:
E – Endangered
T – Threatened
C – Candidate

This page intentionally left blank.

MEETING SUMMARY CH2MHILL®

Santa Susana Field Laboratory–EIS

NASA and USFWS Consultation Meeting

ATTENDEES:	Jeremiah Kolb/NASA	Gary Santolo/CH2M HILL
	Jenny Marek/USFWS	Leslie Tice/CH2M HILL
	Laurel Karren/CH2M HILL	Russ Huddleston/CH2M HILL
COPIES:	Amy Keith/NASA	
	Allen Elliott/NASA	
	Beth Vaughan/CH2M HILL	
FROM:	CH2M HILL	
DATE:	April 25, 2012	
METHOD:	Teleconference with LiveMeeting	

Gary Santolo provided an overview of the completed biological habitat, protocol level rare plant, and opportunistic wildlife surveys and reports.

Russ Huddleston gave an overview of the wetlands delineation completed in January 2012 and the report that was submitted to US Army Corps of Engineers (USACE) in April. He stated that a verification site visit was being coordinated, followed by a teleconference with USACE, the Regional Water Quality Control Board, and the California Department of Fish and Game (CDFG) to discuss the findings and verification process.

Russ added that during the delineation the team completed a California Red Legged Frog Habitat (CRLF) Survey, based on Jenny Marek's request at the last consultation meeting. The team found that the area is within the range of habitat, but because it was so patchy and segmented, it was concluded that ~~habitat~~ presence is possible but unlikely. CRLF habitat survey reports will be appended to the biological assessment (BA).

The wetlands survey team looked at vernal pools in the rock basin. Because Russ Huddleston holds a permit for fairy shrimp collection, the team was prepared to conduct opportunistic dipnetting. Conditions were unseasonably dry this year however and inadequate for such surveys. Jenny Marek said that she has information from the Department of Energy (DOE) fairy shrimp surveys in previous years. She will provide this information.

Jeremiah Kolb provided the results of the Quino checkerspot butterfly habitat survey, completed in March 2012. Although seasonal conditions in 2012 were very dry, due diligence was taken prior to the survey to confirm sufficient survey timing. Dr. Arnold and Russ Huddleston polled their colleagues as well as Tarja Sager at the National Park Service to inquire about sitings of the butterfly food plants in the region. Results were that plants were in bloom at the time of the survey. A small area of *Plantago erecta* was identified in the NASA-administered Area I (location identified on a map for Ms. Marek). Dr. Arnold concluded however that the small population of plants was unsuitable and extremely unlikely to provide habitat for the Quino checkerspot butterfly. The report will be appended to the BA. Jenny Marek suggested noting the coordination with Tarja Sager prior to the field survey in the BA.

As a result of the surveys and findings, Jenny Marek concluded that the NASA team has conducted the appropriate studies and consideration necessary to reach a determination of potential effects.

Laurel Karren provided an overview of the BA approach and findings. Consistent with the species list provided by USFWS, the BA covers the Quino checkerspot butterfly, the CRLF, Riverside Fairy Shrimp, Vernal Pool Fairy Shrimp, and the least Bell's vireo. Laurel showed Jenny the species locations on a map overlain by the environmental cleanup area of the Cleanup to Background Alternative (confirmed by Jenny to be the most aggressive project alternative) and additional footprint areas for staging and stockpiling. Laurel added that the BA considers all

technical approaches to meet the cleanup goals, consistent with the EIS analysis, in the case that several technologies are implemented. Jenny agreed with this approach.

Laurel concluded that, with this process, NASA concluded in the BA that there is a potential to effect but not likely to adversely affect CRLF, the two species of fairy shrimp, and the least Bell's vireo. Based on the findings of the March survey, there would be no effect on the Quino checkerspot butterfly.

Jenny asked about the gnatcatcher. Gary responded that no suitable habitat was identified during the habitat surveys. While coastal sage scrub was observed, it was not extensive, it was fragmented, and surrounding habitat was not supportive.

Other Discussions

Migratory Birds are covered in the EIS. Jenny suggested adding the typical best management practices of pre-work bird nesting surveys if work is conducted within nesting season (likely) and to work outside of nesting season as possible. Jenny added that they typically suggest buffers of

- 300 feet of non-listed bird nesting
- 500 feet of raptor nests
- 500 feet of other threatened or endangered species

Jenny will check with the migratory bird division at USFWS to see if there are any other mitigations or BMPs that should be included.

Laurel added that through the analysis it was found that project work would be 75 feet from the designated migration corridor, overlapping the very southeastern corner of Area II. As such, there would be no direct effects of the action. Jenny offered to check with the migration corridor division of USFWS for appropriate mitigations or BMPs to address potential indirect effects.

Lastly, Jeremiah confirmed with Jenny that a request for formal consultation and concurrence could accompany the BA in the form of a letter. Jenny agreed and clarified that typically this letter would include a table summarizing the listed species and the findings of effects and a formal request for concurrence. Jeremiah confirmed that the species list provided by USFWS in January would suffice.

Timeline for Section 7 Consultation–

- The draft wetlands delineation report has been submitted to USACE, however response back from the designated project manager has not been received. Jeremiah and Jenny agreed that it will likely be Antal Szijj, who is working with DOE and Boeing. The verification site visit will likely take place in May.
- CH2M HILL is finalizing the draft BA now and will incorporate information and additional detail from this meeting. NASA will review the BA next and is on track to submit the BA to USFWS in early June, as previously discussed.
- Jenny added that USFWS's timeline for concurring a finding of *Not Likely to Adversely Affect* is typically 30 days. It otherwise acknowledges but does not concur with findings of *No Effect*.

Future Coordination and Consultation–

- Jenny encouraged NASA to have a similar meeting to keep Mary Meyers in the loop.
- Following the USACE verification, NASA will hold a teleconference with USACE, RWQCB, and CDFG to review wetlands/waters findings.
- After USFWS receives the BA, NASA will set up the next consultation call with Jenny to discuss BA information and possible mitigations.

Action Items

- CH2M HILL and NASA will update the BA based on meeting discussions.

- NASA will submit with the BA, a letter asking for concurrence, per the direction of Jenny Marek.
- Jenny Marek will provide to NASA:
  - DOE fairy shrimp survey data
  - Feedback re: mitigations or BMPs relevant to either migratory birds or migration corridors.

This page intentionally left blank.

L-3: Other Agency Consultation

This page intentionally left blank.

MEETING SUMMARY

Santa Susana Field Laboratory–EIS

NASA and CDFG Consultation Meeting

ATTENDEES:	Jeremiah Kolb/ERT	Gary Santolo/CH2M HILL
	Amy Keith/NASA	Jason Glasgow/CH2M HILL
	Mary Meyer/CDFG	Russ Huddleston/CH2M HILL
	Jeff Humble/CDFG	
	Brock /CDFG	
COPIES:	Allen Elliott/NASA	
	Beth Vaughan/CH2M HILL	
FROM:	CH2M HILL	
DATE:	May 14, 2012	
METHOD:	Teleconference with LiveMeeting	

- The team reviewed the NASA-administered areas and the studies that have been completed to update Jeff Humble/CDFG on the progress.
- Gary Santolo/CH2M HILL reviewed the surveys that have been conducted and the habitat mapping efforts and reviewed the list of species that were identified during the surveys. Jeff Humble was interested in the ringtail cat that was spotted and the home range and habitat that would support the species.
- Mary Meyer/CDFG suggested that NASA speak to the other teams at SSFL (The Boeing Company and the Department of Energy) and evaluate how the results of their surveys compare with NASA's.
- Jason Glasgow/CH2M HILL explained the current sampling that is being conducted, the implications of the Administrative Order on Consent (AOC), and how the Department of Toxic Substances Control (DTSC) is integrated into the project.
- Mary Meyer requested information regarding the wetland survey and if there was standing water and the potential habitat for the fairy shrimp. No standing water was in the vernal pools during the survey; however, there is a potential they could be present. The operations at the R-2 ponds were also discussed and the Coca pond that stays pretty wet. The Horse Pond and two-striped garter snake that was found was mentioned, along with a seep that is on a map that may feed the pond. There was discussion on whether the seep was seasonal (having been observed during the fall survey). There are some state sensitive species that have been identified in the area that may be near the Horse Pond.
- Russ Huddleston/CH2M HILL spoke about the January wetland survey results and explained that they have been sent to the U.S. Army Corps of Engineers (USACE) for verification purposes. USACE may want to conduct a site visit.
- Mary Meyer is going to seek clarification with DTSC on their Council of Environmental Quality Act (CEQA) role in the process. She is concerned about the jurisdiction of the ephemeral drainages in Area I and Area II.
- Discussion was held on what wetlands are under USACE jurisdiction.
- The butterfly survey was discussed and the results indicate that habitat is not present to support them.
- Rare plant surveys have been completed. CDFG discussed potential effects to Santa Susana tarplant; Gary Santolo pointed out that most of the tarplant were found on the rock outcrops and would not be affected by remediation.

This page intentionally left blank.

End of Appendix L

This page intentionally left blank.